

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
Richard William Falla LE PAGE et al.	)	Group Art Unit: To Be Assigned
	)	
Application Number: To Be Assigned	)	Examiner: To Be Assigned
	)	
Filed: January 26, 2001	)	
	)	
For: NUCLEIC ACIDS AND PROTEINS FROM STREPTOCOCCUS PNEUMONIAE	)	

SUBMISSION OF SEQUENCE LISTING

Commissioner for Patents  
Washington, D.C. 20231

Sir:

Applicants submit herewith a paper copy of the Sequence Listing as filed in parent application number PCT/GB99/02452 filed July 27, 1999. The Sequence Listing in this application is identical to the Sequence Listing submitted in the parent application.

Applicants respectfully submit that it is unnecessary to file a computer readable form of the Sequence Listing, since it would be a duplicate of the computer readable form submitted in parent application number PCT/GB99/02452. Therefore, in accordance with 37 C.F.R. §1.821(e), no computer readable form is enclosed.

Applicants herewith request that the computer readable form submitted in parent application number PCT/GB99/02452 be used in this application. The undersigned certifies his belief that the computer readable form submitted in the parent application is identical in content to the paper copy of the Sequence Listing enclosed herewith.

ENCLOSURE

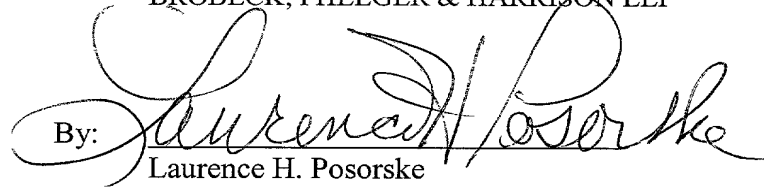
It is believed that no fees are required for this submission; however, the Commissioner is authorized to charge any fee necessary for entry of this paper to Deposit Account 50-1640.

Respectfully submitted,

BROBECK, PHLEGER & HARRISON LLP

January 26, 2001

By:



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Registration No. 34,698

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LHP:nej

## SEQUENCE LISTING

<110> Microbial Technics Limited

Le Page, Richard WF

Wells, Jeremy M

Hanniffy, Sean B

<120> Proteins

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<140> PCT/GB99/02444

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<150> GB 9816335.5

<151> 1998-07-27

<150> US 60/125163

<151> 1999-03-19

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Ala Phe Met Ile Ser Lys Gly Gln Val Thr Val Gly Asp Leu Val Thr  
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Asp His Tyr Leu Thr Asn Val Asn Gln Thr Ala Val Leu Ile Leu Val
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Gly Tyr Tyr Ser Met Tyr Val Leu Gln Thr Leu Ile Gln Tyr Phe Gly
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Asn Leu Phe Phe Ala Arg Val Ser Tyr Ser Ile Val Arg Asp Ile Arg
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Val Asn Val Tyr Arg Lys Lys Ser Val Thr Val Ile Ala Lys Thr Arg  
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Arg Leu Phe Asp Pro Leu Ile Glu Val Thr Gln Asn Phe Ser Thr Leu  
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ggttcaccaa gagaaagttt tggaggggga cgtttaggaa ccactcatgc aatgagtcgt 2340  
cgtgttttgg ttgattccat taaatatctt acaagtgaat ttaaagttga tggtttccgt 2400  
tttgatatga tgggagatca tgatgcggct gcgattgaat tagcttataa agaagctaaa 2460  
gctattaatc ctaatatgat tatgattggg gagggctgga gaacattcca aggcgatcaa 2520  
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cttaccttgc atgatgtgat tgcaaaatca attaataaag accctaaggt agctgaagaa 2820  
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gtttctaata agaccgatc atatctgaca aatgaagcta atttgccaaa aactggagat 3660  
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&lt;210&gt; 10

&lt;211&gt; 1250

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 10

Met Lys Arg Lys Asp Leu Phe Gly Asp Lys Gln Thr Gln Tyr Thr Ile  
 1 5 10 15

Arg Lys Leu Ser Val Gly Val Ala Ser Val Ala Thr Gly Val Cys Ile  
 20 25 30

Phe Leu His Ser Pro Gln Val Phe Ala Glu Glu Val Ser Val Ser Pro  
 35 40 45

Ala Thr Thr Ala Ile Ala Lys Ser Asn Ile Asn Gln Val Asp Asn Arg  
 50 55 60

Gln Ser Thr Asn Leu Lys Asp Asp Ile Asn Ser Asn Ser Glu Thr Val  
 65 70 75 80

Val Thr Pro Ser Asp Met Pro Asp Thr Lys Gln Leu Val Ser Asp Glu  
 85 90 95

Thr Asp Thr Gln Lys Gly Val Thr Glu Pro Asp Lys Ala Thr Ser Leu  
 100 105 110

Leu Glu Glu Asn Lys Gly Pro Val Ser Asp Lys Asn Thr Leu Asp Leu  
 115 120 125

Lys Val Ala Pro Ser Thr Leu Gln Asn Thr Pro Asp Lys Thr Ser Gln  
 130 135 140

Ala Ile Gly Ala Pro Ser Pro Thr Leu Lys Val Ala Asn Gln Ala Pro  
 145 150 155 160

Gln Ile Glu Asn Gly Tyr Phe Arg Leu His Leu Lys Glu Leu Pro Gln  
 165 170 175

Gly His Pro Val Glu Ser Thr Gly Leu Trp Ile Trp Gly Asp Val Asp  
 180 185 190

Gln Pro Ser Ser Asn Trp Pro Asn Gly Ala Ile Pro Met Thr Asn Ala  
 195 200 205

Lys Lys Asp Asp Tyr Gly Tyr Tyr Val Asp Phe Lys Leu Ser Glu Lys  
 210 215 220

Gln Arg Lys Gln Ile Ser Phe Leu Ile Asn Asn Lys Ala Gly Thr Asn  
 225 230 235 240

Leu Ser Gly Asp His His Ile Pro Leu Leu Arg Pro Glu Met Asn Gln  
 245 250 255

Val Trp Ile Asp Glu Lys Tyr Gly Ile His Thr Tyr Gln Pro Leu Lys  
 260 265 270

Glu Gly Tyr Val Arg Ile Asn Tyr Leu Ser Ser Ser Gly Asn Tyr Asp  
 275 280 285

His Leu Ser Ala Trp Leu Phe Lys Asp Val Ala Thr Pro Ser Thr Thr  
 290 295 300

Trp Pro Asp Gly Ser Asn Phe Val Asn Gln Gly Leu Tyr Gly Arg Tyr  
 305 310 315 320

Ile Asp Val Pro Leu Lys Thr Asn Ala Lys Glu Ile Gly Phe Leu Ile  
 325 330 335

Leu Asp Glu Ser Lys Thr Gly Asp Ala Val Lys Val Gln Pro Asn Asp  
 340 345 350

Tyr Val Phe Arg Asp Leu Ala Asn His Asn Gln Ile Phe Val Lys Asp  
 355 360 365

Lys Asp Pro Lys Val Tyr Asn Asn Pro Tyr Tyr Ile Asp Gln Val Gln  
 370 375 380

Val Asn Asp Asp Ile Lys Thr Ala Lys Ala Ala Phe Val Asn Pro Ser  
580 585 590

Asp Ser Ile Lys Tyr Leu Thr Ser Glu Phe Lys Val Asp Gly Phe Arg  
785                      790                      795                      800

Phe Asp Met Met Gly Asp His Asp Ala Ala Ala Ile Glu Leu Ala Tyr  
805 810 815

Lys Glu Ala Lys Ala Ile Asn Pro Asn Met Ile Met Ile Gly Glu Gly  
820 825 830

Trp Arg Thr Phe Gln Gly Asp Gln Gly Lys Pro Val Lys Pro Ala Asp  
835 840 845

Gln Asp Trp Met Lys Ser Thr Asp Thr Val Gly Val Phe Ser Asp Asp  
850 855 860

Ile Arg Asn Ser Leu Lys Ser Gly Phe Pro Asn Glu Gly Thr Pro Ala  
865 870 875 880

Phe Ile Thr Gly Gly Pro Gln Ser Leu Gln Gly Ile Phe Lys Asn Ile  
885 890 895

Lys Ala Gln Pro Gly Asn Phe Glu Ala Asp Ser Pro Gly Asp Val Val  
900 905 910

Gln Tyr Ile Ala Ala His Asp Asn Leu Thr Leu His Asp Val Ile Ala  
915 920 925

Lys Ser Ile Asn Lys Asp Pro Lys Val Ala Glu Glu Asp Ile His Arg  
930 935 940

Arg Leu Arg Leu Gly Asn Val Met Ile Leu Thr Ser Gln Gly Thr Ala  
945 950 955 960

Phe Ile His Ser Gly Gln Glu Tyr Gly Arg Thr Lys Arg Leu Leu Asn  
965 970 975

Pro Asp Tyr Met Thr Lys Val Ser Asp Asp Lys Leu Pro Asn Lys Ala  
980 985 990

Thr Leu Ile Glu Ala Val Lys Glu Tyr Pro Tyr Phe Ile His Asp Ser  
995 1000 1005

Val Ser Asn Lys Thr Asp Ser Tyr Leu Thr Asn Glu Ala Asn Leu Pro  
1205 1210 1215

Lys Thr Gly Asp Lys Ser Ser Lys Ile Leu Ser Val Val Gly Ile Ser  
 1220 1225 1230

Ile Leu Ala Ser Leu Leu Ala Leu Leu Gly Leu Ser Leu Lys Arg Asn  
 1235 1240 1245

Arg Thr  
 1250

<210> 11  
 <211> 921  
 <212> DNA  
 <213> Streptococcus agalactiae

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 gataagtcag caaaccocaa acagcctacg caaggcatgt cagttgtaac cagcttttac 120  
 ccaatgtatg cgatgacaaa agaagtatct ggagaccta atgatgtgag gatgatccaa 180  
 tcagggtgcag gcattcattc ctttgaaccg tctgtaaatg atgtggcagc tatttatgac 240  
 gcggatttgt ttgtttacca atcacatacc ttagaagctt gggcaaggga tctagaccct 300  
 aatttaaaaa aatcaaagggt taatgtgttt gaagcgtcaa aacctctgac actagataga 360  
 gtcaaagggc tagaagatat ggaagtcaca caaggcattg acctgcgac actttatgac 420  
 ccacatacct ggacggatcc cgttttagct ggtgaggaag ctgttaatat cgctaaagag 480  
 ctaggacatt tggatcctaa acacaaagac agttacacta aaaaggctaa ggctttcaaa 540  
 aaagaagcag agcaactaac tgaagaatac actcaaaaat ttaaaaagggt gcgctcaaaa 600  
 acatttgtga cgcaacacac ggcattttct tatctggcta aacgattcgg cttgaaacaa 660  
 cttggtatct cgggtatttc tccagagcaa gagccctctc ctgcgaatt gaaagaaatt 720  
 caagactttg ttaaagaata caacgtcaag actatttttg cagaagacaa cgtcaacccc 780  
 aaaattgctc atgctattgc gaaatcaaca ggagctaaag taaagacatt aagtccactt 840  
 gaagctgctc caagcggaaa caagacatat ctagaaaatc ttagagcaaa tttggaagtg 900  
 ctctatcaac agttgaagta a 921

&lt;210&gt; 12

&lt;211&gt; 306

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 12

Met Lys Lys Val Phe Phe Leu Met Ala Met Val Val Ser Leu Val Met  
 1 5 10 15

Ile Ala Gly Cys Asp Lys Ser Ala Asn Pro Lys Gln Pro Thr Gln Gly  
 20 25 30

Met Ser Val Val Thr Ser Phe Tyr Pro Met Tyr Ala Met Thr Lys Glu  
 35 40 45

Val Ser Gly Asp Leu Asn Asp Val Arg Met Ile Gln Ser Gly Ala Gly  
 50 55 60

Ile His Ser Phe Glu Pro Ser Val Asn Asp Val Ala Ala Ile Tyr Asp  
 65 70 75 80

Ala Asp Leu Phe Val Tyr Gln Ser His Thr Leu Glu Ala Trp Ala Arg  
 85 90 95

Asp Leu Asp Pro Asn Leu Lys Lys Ser Lys Val Asn Val Phe Glu Ala  
 100 105 110

Ser Lys Pro Leu Thr Leu Asp Arg Val Lys Gly Leu Glu Asp Met Glu  
 115 120 125

Val Thr Gln Gly Ile Asp Pro Ala Thr Leu Tyr Asp Pro His Thr Trp  
 130 135 140

Thr Asp Pro Val Leu Ala Gly Glu Glu Ala Val Asn Ile Ala Lys Glu  
 145 150 155 160

Leu Gly His Leu Asp Pro Lys His Lys Asp Ser Tyr Thr Lys Lys Ala  
 165 170 175

Lys Ala Phe Lys Lys Glu Ala Glu Gln Leu Thr Glu Glu Tyr Thr Gln  
 180 185 190

Lys Phe Lys Lys Val Arg Ser Lys Thr Phe Val Thr Gln His Thr Ala  
 195 200 205

Phe Ser Tyr Leu Ala Lys Arg Phe Gly Leu Lys Gln Leu Gly Ile Ser  
 210 215 220

Gly Ile Ser Pro Glu Gln Glu Pro Ser Pro Arg Gln Leu Lys Glu Ile  
 225 230 235 240

Gln Asp Phe Val Lys Glu Tyr Asn Val Lys Thr Ile Phe Ala Glu Asp  
 245 250 255

Asn Val Asn Pro Lys Ile Ala His Ala Ile Ala Lys Ser Thr Gly Ala  
 260 265 270

Lys Val Lys Thr Leu Ser Pro Leu Glu Ala Ala Pro Ser Gly Asn Lys  
 275 280 285

Thr Tyr Leu Glu Asn Leu Arg Ala Asn Leu Glu Val Leu Tyr Gln Gln  
 290 295 300

Leu Lys  
 305

<210> 13

<211> 657

<212> DNA

<213> Streptococcus agalactiae

<400> 13

ttgttcaata aaataggttt tagaacttgg aaatcaggaa agctttggct ttatatggga 60  
 gtgctaggat caactattat tttaggatca agtcctgtat ctgctatgga tagtggttga 120  
 aatcaaagtc aaggtaatgt tttagagcgt cgccaacgtg atgcggaaaa caaaagtcag 180

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<210> 14
<211> 218
<212> PRT
<213> Streptococcus agalactiae
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Met Phe Asn Lys Ile Gly Phe Arg Thr Trp Lys Ser Gly Lys Leu Trp  
1 5 10 15

Val Ser Ala Met Asp Ser Val Gly Asn Gln Ser Gln Gly Asn Val Leu  
35 40 45

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Gly Asn Val Leu  
65 70 75 80

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Gly Asn Val Leu  
100 105 110

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Val Gly Gln Leu  
 115 120 125

Ile Gly Lys Asn Pro Leu Phe Ser Lys Pro Thr Val Ser Arg Glu Asn  
 130 135 140

Asn His Ser Ser Gln Gly Asp Ser Asn Lys Gln Ser Phe Ser Lys Lys  
 145 150 155 160

Val Ser Gln Val Thr Asn Val Ala Asn Arg Pro Met Leu Thr Asn Asn  
 165 170 175

Ser Arg Thr Ile Ser Val Ile Asn Lys Leu Pro Lys Thr Gly Gly Asp  
 180 185 190

Gln Asn Val Ile Phe Lys Leu Val Gly Phe Gly Leu Ile Leu Leu Thr  
 195 200 205

Ser Arg Cys Gly Leu Arg Arg Asn Glu Asn  
 210 215

<210> 15

<211> 1029

<212> DNA

<213> Streptococcus agalactiae

<400> 15

atgacaaaaa aacttattat tgctatatta gcactatgca ctatcttaac cactttctcaa 60  
 gctgttttag ctaaagaaaa atcacaaact gttaccataa aaaacaacta ttcgggtctat 120  
 attaaaaaag aaaaaagaga caagccggat aataaaaagc aaatcagcga gacacttaaa 180  
 gttcctttta aacccaaaaa agtagttggt tttgatatgg gagctttgga tactatcaca 240  
 gcttttaggag ctgaaaaatc tgttattggt atcccgagg ctaaaaatgc tctaagttta 300  
 ttgccaata acgtcaaact tgtttataaa gctaagagat accaagacgt aggaagtctc 360  
 ttcgaaccaa actttgaagc tattgctcgt atgcaacctg atgtgggtttt cctaggagca 420  
 cgtatggctt ctgttgataa tattgaaaaa ttaaaggagg ctgcacctaa agcagcatta 480  
 gtatatgctg gagtcgactc aaaaaaagta tttgacaaag gagttgctga gcgtgtcaca 540

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atgttaggga aaatcttcga ccaaaataaa aaggcaaaaa cctttaataa agatatcgca 600
caagctgttc tttaaattgca gaaaactatt gagaaaaaag gtaaacctac agctctattt 660
gtaatggcaa acagcgggtga acttttaact caatcacctt ctggtcgttt tggttggatt 720
ttctctgtag gtggatttaa agcagtcaat gaaaatgaaa aactaagttc acatgggtact 780
cccgtatctt atgaatacat cgctgaaaaa aatcctaact atctctttgt tttagatcgt 840
ggagcgacta ttggacaagg agcttcatca aaagaacttt ttaataacga tgttattaaa 900
gcaactgatg ctgtcaaaaa caaacgtgtt catgaggtag atggaaaaga ttggtatatac 960
aattcaggcg gaagccgagt aacactccgt atgattaaag atgtacagaa ctttgttgat 1020
aatcgtaa                                     1029

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<210> 16

<211> 342

<212> PRT

<213> Streptococcus agalactiae

<400> 16

Met Thr Lys Lys Leu Ile Ile Ala Ile Leu Ala Leu Cys Thr Ile Leu

1 5 10 15

Thr Thr Ser Gln Ala Val Leu Ala Lys Glu Lys Ser Gln Thr Val Thr

20 25 30

Ile Lys Asn Asn Tyr Ser Val Tyr Ile Lys Lys Glu Lys Arg Asp Lys

35 40 45

Pro Asp Asn Lys Lys Gln Ile Ser Glu Thr Leu Lys Val Pro Leu Lys

50 55 60

Pro Lys Lys Val Val Val Phe Asp Met Gly Ala Leu Asp Thr Ile Thr

65 70 75 80

Ala Leu Gly Ala Glu Lys Ser Val Ile Gly Ile Pro Lys Ala Lys Asn

85 90 95

Ala Leu Ser Leu Leu Pro Asn Asn Val Lys Ser Val Tyr Lys Ala Lys

100 105 110

Arg Tyr Gln Asp Val Gly Ser Leu Phe Glu Pro Asn Phe Glu Ala Ile  
 115 120 125

Ala Arg Met Gln Pro Asp Val Val Phe Leu Gly Ala Arg Met Ala Ser  
 130 135 140

Val Asp Asn Ile Glu Lys Leu Lys Glu Ala Ala Pro Lys Ala Ala Leu  
 145 150 155 160

Val Tyr Ala Gly Val Asp Ser Lys Lys Val Phe Asp Lys Gly Val Ala  
 165 170 175

Glu Arg Val Thr Met Leu Gly Lys Ile Phe Asp Gln Asn Lys Lys Ala  
 180 185 190

Lys Thr Phe Asn Lys Asp Ile Ala Gln Ala Val Leu Lys Leu Gln Lys  
 195 200 205

Thr Ile Glu Lys Lys Gly Lys Pro Thr Ala Leu Phe Val Met Ala Asn  
 210 215 220

Ser Gly Glu Leu Leu Thr Gln Ser Pro Ser Gly Arg Phe Gly Trp Ile  
 225 230 235 240

Phe Ser Val Gly Gly Phe Lys Ala Val Asn Glu Asn Glu Lys Leu Ser  
 245 250 255

Ser His Gly Thr Pro Val Ser Tyr Glu Tyr Ile Ala Glu Lys Asn Pro  
 260 265 270

Asn Tyr Leu Phe Val Leu Asp Arg Gly Ala Thr Ile Gly Gln Gly Ala  
 275 280 285

Ser Ser Lys Glu Leu Phe Asn Asn Asp Val Ile Lys Ala Thr Asp Ala  
 290 295 300

Val Lys Asn Lys Arg Val His Glu Val Asp Gly Lys Asp Trp Tyr Ile  
 305 310 315 320

Asn Ser Gly Gly Ser Arg Val Thr Leu Arg Met Ile Lys Asp Val Gln  
 325 330 335

Asn Phe Val Asp Asn Arg  
 340

<210> 17

<211> 2469

<212> DNA

<213> Streptococcus agalactiae

<400> 17

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 ggaagttacc agcttggtta gcatcatatg ggtctagcaa caaaggacaa tcagattgcc 120  
 tatattgatg atagcaaagg taaggtaaaa gccctaaaa caaacaaaac gatggatcaa 180  
 atcagtgtcg aagaaggcat ctctgtgtaa cagatcgtag tcaaaattac tgaccaaggt 240  
 tatgttaoct cacacgggtga ccattatcat ttttacaatg ggaaagttcc ttatgatgcy 300  
 attattagtg aagagttggt gatgacggat cctaattacc attttaaaca atcagacggt 360  
 atcaatgaaa tcttagacgg ttacgttatt aaagtcaatg gcaactatta tgtttacctc 420  
 aagccaggta gtaagcgcaa aaacattcga accaaacaac aaattgctga gcaagtagcc 480  
 aaaggaacta aagaagctaa agaaaaagg ttagctcaag tggcccatct cagtaaagaa 540  
 gaagttgcgg cagtcaatga agcaaaaaga caaggacgct atactacaga cgatggctat 600  
 attttttagtc cgacagatat cattgatgat ttaggagatg cttatttagt acctcatggt 660  
 aatcactatc atttatattc taaaaaagat ttgtctocaa gtgagctagc tgctgcacaa 720  
 gcctactgga gtcaaaaaca aggtcgaggt gctagaccgt ctgattaccg cccgacacca 780  
 gcccagggtc gtaggaaagc cccaattcct gatgtgacgc ctaaccctgg acaaggatcat 840  
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 aaacacccaaa gagatgagtt taaaggaaaa acctttaagg aacttttaga tcatctacac 960  
 cgtcttgatt tgaaataccg tcatgtggaa gaagatgggt tgatttttga accgactcaa 1020  
 gtgatcaaat caaacgcttt tgggtatgtg gtgcctcatg gagatcatta tcatattatc 1080  
 ccaagaagtc agttatcacc tcttgaaatg gaattagcag atcgatactt agccggccaa 1140  
 actgatgaca acgactcagg ttcagatcac tcaaaacct cagataaaga agtgacacat 1200  
 acctttcttg gtcacgcat caaagcttac ggaaaaggct tagatggtaa accatatgat 1260  
 acgagtgatg cttatgtttt tagtaaagaa tccattcatt cagtggataa atcaggaggt 1320  
 acagctaaac acggagatca tttccactat ataggatttg gagaacttga acaatatgag 1380  
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ttggatcagg aacaaggcaa agaaaaacca ctctttgaca ctaaaaaagt gagtcgcaaa 1500  
 gtaacaaaag atggtaaagt gggctatatatt atgccaaaag atggcaagga ctattttctat 1560  
 gctcgttatc aacttgatit gactcagatt gcctttgccg aacaagaact aatgcttaaa 1620  
 gataagaagc attaccgtta tgacattggt gatacaggca ttgagccacg acttgctgta 1680  
 gatgtgtcaa gtctgccgat gcatgctggt aatgctactt acgatactgg aagttcgttt 1740  
 gttatcccac atattgatca tatccatgtc gttccgtatt catggttgac ggcgaatcag 1800  
 attgcaacaa tcaagtatgt gatgcaacac cccgaagtto gtccggatgt atggtctaag 1860  
 ccagggcatg aagagtcagg ttcggtcatt ccaaagtta cgctcttga taaacgtgct 1920  
 ggtatgccaa actggcaaat tatccattct gctgaagaag ttcaaaaagc cctagcagaa 1980  
 ggtcgttttg cagcaccaga cggctatatatt ttcatccac gagatgtttt ggcaaaaagaa 2040  
 acttttgtat ggaaagatgg ctcccttagc atcccaagag cagatggcag ttcattgaga 2100  
 accattaata aatccgatct atcccaagct gagtggcaac aagctcaaga gttattggca 2160  
 aagaaaaatg ctggtgatgc tactgatacg gataaacctg aagaaaaagca acaggcagat 2220  
 aagagcaatg aaaaccaaca gccaaagtga gccagtaaag aagaaaaaga atcagatgac 2280  
 tttatagaca gtttaccaga ctatggtcta gatagagcaa ccctagaaga tcatatcaat 2340  
 caattagcac aaaaagctaa tatcgatcct aagtatctca ttttccaacc agaaggtgtc 2400  
 caattttata ataaaaatgg tgaattggta acttatgata tcaagacact tcaacaaata 2460  
 aacccttaa 2469

<210> 18

<211> 822

<212> PRT

<213> Streptococcus agalactiae

<400> 18

Met Lys Lys Thr Tyr Gly Tyr Ile Gly Ser Val Ala Ala Ile Leu Leu

1

5

10

15

Ala Thr His Ile Gly Ser Tyr Gln Leu Gly Lys His His Met Gly Leu

20

25

30

Ala Thr Lys Asp Asn Gln Ile Ala Tyr Ile Asp Asp Ser Lys Gly Lys

35

40

45

Val Lys Ala Pro Lys Thr Asn Lys Thr Met Asp Gln Ile Ser Ala Glu

50

55

60

Glu Gly Ile Ser Ala Glu Gln Ile Val Val Lys Ile Thr Asp Gln Gly  
 65 70 75 80

Tyr Val Thr Ser His Gly Asp His Tyr His Phe Tyr Asn Gly Lys Val  
 85 90 95

Pro Tyr Asp Ala Ile Ile Ser Glu Glu Leu Leu Met Thr Asp Pro Asn  
 100 105 110

Tyr His Phe Lys Gln Ser Asp Val Ile Asn Glu Ile Leu Asp Gly Tyr  
 115 120 125

Val Ile Lys Val Asn Gly Asn Tyr Tyr Val Tyr Leu Lys Pro Gly Ser  
 130 135 140

Lys Arg Lys Asn Ile Arg Thr Lys Gln Gln Ile Ala Glu Gln Val Ala  
 145 150 155 160

Lys Gly Thr Lys Glu Ala Lys Glu Lys Gly Leu Ala Gln Val Ala His  
 165 170 175

Leu Ser Lys Glu Glu Val Ala Ala Val Asn Glu Ala Lys Arg Gln Gly  
 180 185 190

Arg Tyr Thr Thr Asp Asp Gly Tyr Ile Phe Ser Pro Thr Asp Ile Ile  
 195 200 205

Asp Asp Leu Gly Asp Ala Tyr Leu Val Pro His Gly Asn His Tyr His  
 210 215 220

Tyr Ile Pro Lys Lys Asp Leu Ser Pro Ser Glu Leu Ala Ala Ala Gln  
 225 230 235 240

Ala Tyr Trp Ser Gln Lys Gln Gly Arg Gly Ala Arg Pro Ser Asp Tyr  
 245 250 255

Arg Pro Thr Pro Ala Pro Gly Arg Arg Lys Ala Pro Ile Pro Asp Val  
 260 265 270

Thr Pro Asn Pro Gly Gln Gly His Gln Pro Asp Asn Gly Gly Tyr His  
 275 280 285

Pro Ala Pro Pro Arg Pro Asn Asp Ala Ser Gln Asn Lys His Gln Arg  
 290 295 300

Asp Glu Phe Lys Gly Lys Thr Phe Lys Glu Leu Leu Asp His Leu His  
 305 310 315 320

Arg Leu Asp Leu Lys Tyr Arg His Val Glu Glu Asp Gly Leu Ile Phe  
 325 330 335

Glu Pro Thr Gln Val Ile Lys Ser Asn Ala Phe Gly Tyr Val Val Pro  
 340 345 350

His Gly Asp His Tyr His Ile Ile Pro Arg Ser Gln Leu Ser Pro Leu  
 355 360 365

Glu Met Glu Leu Ala Asp Arg Tyr Leu Ala Gly Gln Thr Asp Asp Asn  
 370 375 380

Asp Ser Gly Ser Asp His Ser Lys Pro Ser Asp Lys Glu Val Thr His  
 385 390 395 400

Thr Phe Leu Gly His Arg Ile Lys Ala Tyr Gly Lys Gly Leu Asp Gly  
 405 410 415

Lys Pro Tyr Asp Thr Ser Asp Ala Tyr Val Phe Ser Lys Glu Ser Ile  
 420 425 430

His Ser Val Asp Lys Ser Gly Val Thr Ala Lys His Gly Asp His Phe  
 435 440 445

His Tyr Ile Gly Phe Gly Glu Leu Glu Gln Tyr Glu Leu Asp Glu Val  
 450 455 460

Ala Asn Trp Val Lys Ala Lys Gly Gln Ala Asp Glu Leu Val Ala Ala  
 465 470 475 480

Leu Asp Gln Glu Gln Gly Lys Glu Lys Pro Leu Phe Asp Thr Lys Lys  
 485 490 495

Val Ser Arg Lys Val Thr Lys Asp Gly Lys Val Gly Tyr Ile Met Pro  
 500 505 510

Lys Asp Gly Lys Asp Tyr Phe Tyr Ala Arg Tyr Gln Leu Asp Leu Thr  
 515 520 525

Gln Ile Ala Phe Ala Glu Gln Glu Leu Met Leu Lys Asp Lys Lys His  
 530 535 540

Tyr Arg Tyr Asp Ile Val Asp Thr Gly Ile Glu Pro Arg Leu Ala Val  
 545 550 555 560

Asp Val Ser Ser Leu Pro Met His Ala Gly Asn Ala Thr Tyr Asp Thr  
 565 570 575

Gly Ser Ser Phe Val Ile Pro His Ile Asp His Ile His Val Val Pro  
 580 585 590

Tyr Ser Trp Leu Thr Arg Asn Gln Ile Ala Thr Ile Lys Tyr Val Met  
 595 600 605

Gln His Pro Glu Val Arg Pro Asp Val Trp Ser Lys Pro Gly His Glu  
 610 615 620

Glu Ser Gly Ser Val Ile Pro Asn Val Thr Pro Leu Asp Lys Arg Ala  
 625 630 635 640

Gly Met Pro Asn Trp Gln Ile Ile His Ser Ala Glu Glu Val Gln Lys  
 645 650 655

Ala Leu Ala Glu Gly Arg Phe Ala Ala Pro Asp Gly Tyr Ile Phe Asp  
 660 665 670

Pro Arg Asp Val Leu Ala Lys Glu Thr Phe Val Trp Lys Asp Gly Ser  
 675 680 685

Phe Ser Ile Pro Arg Ala Asp Gly Ser Ser Leu Arg Thr Ile Asn Lys  
 690 695 700

Ser Asp Leu Ser Gln Ala Glu Trp Gln Gln Ala Gln Glu Leu Leu Ala  
 705 710 715 720

Lys Lys Asn Ala Gly Asp Ala Thr Asp Thr Asp Lys Pro Glu Glu Lys  
 725 730 735

Gln Gln Ala Asp Lys Ser Asn Glu Asn Gln Gln Pro Ser Glu Ala Ser  
 740 745 750

Lys Glu Glu Lys Glu Ser Asp Asp Phe Ile Asp Ser Leu Pro Asp Tyr  
 755 760 765

Gly Leu Asp Arg Ala Thr Leu Glu Asp His Ile Asn Gln Leu Ala Gln  
 770 775 780

Lys Ala Asn Ile Asp Pro Lys Tyr Leu Ile Phe Gln Pro Glu Gly Val  
 785 790 795 800

Gln Phe Tyr Asn Lys Asn Gly Glu Leu Val Thr Tyr Asp Ile Lys Thr  
 805 810 815

Leu Gln Gln Ile Asn Pro  
 820

<210> 19

<211> 939

<212> DNA

<213> Streptococcus agalactiae

<400> 19

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 ttaggtttta atgttattgt ttactagga attagtattt ggcaatacag tcgttacagg 180

aaaaaaatgt tacatctcaa atattttaat agtagtcagg acccctcttt cgaacttcaa 240  
 ccgagtgatt acgcttattt taatattatt acacaattag aagctagaga agcgcaaaaa 300  
 gtttctgaaa caattgaaca aaccaatcat gttgcactta tgataaagat gtggtcgcac 360  
 caaatgaaag ttccattggc agctatttca ttaatggccc agacaaatca tctcgatcct 420  
 aaggaagttg aacaacaatt attgaaattg caacattatc ttgaaacgtt gttagcattt 480  
 ttgaaattta gacaatatcg tgacgatttt cgttttgaag ctgttagcct tagagaagta 540  
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 gaagagagta ttagaataca agactacggg atcggcatac tcgaagagga tatccctaga 780  
 ctttttgaag atggctttac gggttacaac ggtcatgagc accaaaaggc aacaggcatg 840  
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 aaaattaatt atgggactgc tgtttctata cataaataa 939

<210> 20

<211> 312

<212> PRT

<213> Streptococcus agalactiae

<400> 20

Met Ile Arg Gln Phe Leu Arg Glu His Leu Ile Trp Tyr Ile Leu Tyr

1 5 10 15

Ile Met Met Phe Val Leu Phe Phe Ile Ser Phe Tyr Leu Tyr His Leu

20 25 30

Pro Met Pro Tyr Leu Phe Asn Ser Leu Gly Leu Asn Val Ile Val Leu

35 40 45

Leu Gly Ile Ser Ile Trp Gln Tyr Ser Arg Tyr Arg Lys Lys Met Leu

50 55 60

His Leu Lys Tyr Phe Asn Ser Ser Gln Asp Pro Ser Phe Glu Leu Gln

65 70 75 80

Pro Ser Asp Tyr Ala Tyr Phe Asn Ile Ile Thr Gln Leu Glu Ala Arg

85 90 95

Glu Ala Gln Lys Val Ser Glu Thr Ile Glu Gln Thr Asn His Val Ala  
 100 105 110

Leu Met Ile Lys Met Trp Ser His Gln Met Lys Val Pro Leu Ala Ala  
 115 120 125

Ile Ser Leu Met Ala Gln Thr Asn His Leu Asp Pro Lys Glu Val Glu  
 130 135 140

Gln Gln Leu Leu Lys Leu Gln His Tyr Leu Glu Thr Leu Leu Ala Phe  
 145 150 155 160

Leu Lys Phe Arg Gln Tyr Arg Asp Asp Phe Arg Phe Glu Ala Val Ser  
 165 170 175

Leu Arg Glu Val Val Val Glu Ile Ile Lys Ser Tyr Lys Val Ile Cys  
 180 185 190

Leu Ser Lys Ser Leu Ser Ile Ile Ile Glu Gly Asp Asn Ile Trp Lys  
 195 200 205

Thr Asp Lys Lys Trp Leu Thr Phe Ala Leu Ser Gln Val Leu Asp Asn  
 210 215 220

Ala Ile Lys Tyr Ser Asn Pro Glu Ser Lys Ile Ile Ile Ser Ile Gly  
 225 230 235 240

Glu Glu Ser Ile Arg Ile Gln Asp Tyr Gly Ile Gly Ile Leu Glu Glu  
 245 250 255

Asp Ile Pro Arg Leu Phe Glu Asp Gly Phe Thr Gly Tyr Asn Gly His  
 260 265 270

Glu His Gln Lys Ala Thr Gly Met Gly Leu Tyr Met Thr Lys Glu Val  
 275 280 285

Leu Ser Ser Leu Asn Leu Ser Ile Ser Val Asp Ser Lys Ile Asn Tyr  
 290 295 300

Gly Thr Ala Val Ser Ile His Lys

305

310

&lt;210&gt; 21

&lt;211&gt; 942

&lt;212&gt; DNA

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 21

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gatattcctc aagaatgggt ttttagctatg aaagataggg ttggacaaac tggaaatcaa 180
attcaggatg taaagctctt ccatgatcac ttatcccaa aatgggaaaa taaaaagctt 240
aatcatatta attatatgac ctatgctcgt tatttcatac ctcagtacat ctcagctgat 300
acagttttat atcttgactc tgacttagtt gttactacta atttagataa cctctttcaa 360
atttcactag acaatgcata ttttagctgca gttccagctc tttttgggct tggatatggg 420
tttaatgctg gagtaatggt aattaacaac caacgttggc gacaagaaaa tatgactatt 480
aaattaattg aaaaaaatca aaaggaaatt gagaatgcc aagaaggga tcaacaatt 540
cttaatcgca tgtttgaaaa tcaggttaatt tatttagatg atacctacaa ttttcaaatt 600
ggttttgata tgggagctgc tatcgatggg cataaattta tttttgacat cccaattacc 660
ccactcccaa aaattattca ctacatttcg ggaatcaaac cttggcaaac attatcaaat 720
atgagactcc gtgaggtatg gtggcactat aatttacttg aatggtcaag tatcatatct 780
agtaaaaaag tatttggttt agaccacca attaaaacac aaaattatcg tctcaatttc 840
cttattgcta caacttctga ttgtatacca tctatctcag aattagtcac tgcccttcca 900
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&lt;210&gt; 22

&lt;211&gt; 313

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 22

Met Thr Tyr Gln Lys Thr Val Val Leu Ala Gly Asp Tyr Ser Tyr Ile

1

5

10

15

Arg Gln Ile Glu Thr Thr Leu Lys Ser Leu Cys Val Tyr His Glu Asn  
20 25 30

Leu Ser Ile Phe Ile Phe Asn Gln Asp Ile Pro Gln Glu Trp Phe Leu  
35 40 45

Ala Met Lys Asp Arg Val Gly Gln Thr Gly Asn Gln Ile Gln Asp Val  
50 55 60

Lys Leu Phe His Asp His Leu Ser Pro Lys Trp Glu Asn Lys Lys Leu  
65 70 75 80

Asn His Ile Asn Tyr Met Thr Tyr Ala Arg Tyr Phe Ile Pro Gln Tyr  
85 90 95

Ile Ser Ala Asp Thr Val Leu Tyr Leu Asp Ser Asp Leu Val Val Thr  
100 105 110

Thr Asn Leu Asp Asn Leu Phe Gln Ile Ser Leu Asp Asn Ala Tyr Leu  
115 120 125

Ala Ala Val Pro Ala Leu Phe Gly Leu Gly Tyr Gly Phe Asn Ala Gly  
130 135 140

Val Met Val Ile Asn Asn Gln Arg Trp Arg Gln Glu Asn Met Thr Ile  
145 150 155 160

Lys Leu Ile Glu Lys Asn Gln Lys Glu Ile Glu Asn Ala Asn Glu Gly  
165 170 175

Asp Gln Thr Ile Leu Asn Arg Met Phe Glu Asn Gln Val Ile Tyr Leu  
180 185 190

Asp Asp Thr Tyr Asn Phe Gln Ile Gly Phe Asp Met Gly Ala Ala Ile  
195 200 205

Asp Gly His Lys Phe Ile Phe Asp Ile Pro Ile Thr Pro Leu Pro Lys  
210 215 220

<400> 23					
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tatattgatg	atagcaaagg	taaggtaaaa	gcccctaaaa	caaacaaaac	gatggatcaa 180
atcagtgcctg	aagaaggcat	ctctgctgaa	cagatcgtag	tcaaaattac	tgaccaaggt 240
tatgttacct	cacacgggtga	ccattatcat	ttttacaatg	ggaaagttcc	ttatgatgcg 300
attatttagtg	aagagttggt	gatgacggat	cctaattacc	atttttaaaca	atcagacggt 360
atcaatgaaa	tcttagacgg	ttacgttatt	aaagtcaatg	gcaactatta	tgtttacctc 420
aagccaggta	gtaagcgcaa	aaacattcga	accaaacaac	aaattgctga	gcaagtagcc 480
aaaggaacta	aagaagctaa	agaaaaaggt	ttagctcaag	tggcccatct	cagtaaagaa 540
gaagttgcgg	cagtcaatga	agcaaaaaaga	caaggacgct	atactacaga	cgatggctat 600
atTTTTtagtc	cgacagatat	cattgatgat	ttaggagatg	cttatttagt	acctcatggg 660
aatcactatc	atttatattcc	taaaaaagat	ttgtctccaa	gtgagctagc	tgctgcacaa 720

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gcctactgga gtcaaaaaca aggtcgaggt gctagaccgt ctgattaccg ccgacacca 780
gccccaggtc gtaggaaagc cccacttcct gatgtgacgc ctaaccctgg acaaggatcat 840
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aactga 1146

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<210> 24

<211> 381

<212> PRT

<213> Streptococcus agalactiae

<400> 24

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Met Lys Lys Thr Tyr Cys Tyr Ile Gly Ser Val Ala Ala Ile Leu Leu
  1             5             10             15

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Ala Thr His Ile Gly Ser Tyr Gln Leu Gly Lys His His Met Gly Leu
          20             25             30

```

```

Ala Thr Lys Asp Asn Gln Ile Ala Tyr Ile Asp Asp Ser Lys Gly Lys
          35             40             45

```

```

Val Lys Ala Pro Lys Thr Asn Lys Thr Met Asp Gln Ile Ser Ala Glu
          50             55             60

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Glu Gly Ile Ser Ala Glu Gln Ile Val Val Lys Ile Thr Asp Gln Gly
          65             70             75             80

```

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Tyr Val Thr Ser His Gly Asp His Tyr His Phe Tyr Asn Gly Lys Val
          85             90             95

```

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Pro Tyr Asp Ala Ile Ile Ser Glu Glu Leu Leu Met Thr Asp Pro Asn
          100            105            110

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Asp Glu Phe Lys Gly Lys Thr Phe Lys Glu Leu Leu Asp Gln Leu His  
305 310 315 320

Arg Leu Asp Leu Lys Tyr Arg His Val Glu Glu Asp Gly Leu Ile Phe  
 325 330 335

Glu Pro Thr Gln Val Ile Lys Ser Asn Ala Phe Gly Tyr Val Val Pro  
 340 345 350

His Gly Asp His Tyr His Ile Ile Pro Arg Ser Gln Leu Ser Pro Leu  
 355 360 365

Glu Met Glu Leu Ala Asp Arg Tyr Leu Thr Arg Pro Asn  
 370 375 380

<210> 25

<211> 660

<212> DNA

<213> Streptococcus agalactiae

<400> 25

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 ggtcaacaaa tagatggagt gaaattcaca cagatatatg aggactatat gaaattactc 180  
 agtcaaggta aggatatcgc agagttatat caaaaatatt ctaaagaaga gttggcaaat 240  
 ctaggcatta atatttatca atccaatgat atagaaagga ctgaggaaag aacttttgat 300  
 gaaattatca gttggggttc caaccottat gcaacaagac caattcaaga aaggcacact 360  
 attcaattag agccaacaag attttcacta gaggataaga aaagaattga agaagctgca 420  
 gctcaaggac taagcgaaat cgacottatt gatttagttg acctatatga tattaattta 480  
 gacaatacaa gcgtcaatcg ccatattgtg gggttattga ctaataacac ccaagtaaca 540  
 tactatttcc aagaacaatt aaataaggag ttgctgtcaa tggctcacgc tttagataac 600  
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<210> 26

<211> 219

<212> PRT

<213> Streptococcus agalactiae

&lt;400&gt; 26

Met Val Asn Asp Ile Leu Glu Arg Met Tyr Lys Glu Asn Ile Pro Lys  
 1 5 10 15

Ser Tyr Leu Thr Ser Val Pro Leu Val Ile Ser Gln Lys Gly Arg Thr  
 20 25 30

Thr Tyr Ser Phe Ser Met Thr Gly Gly Gln Gln Ile Asp Gly Val Lys  
 35 40 45

Phe Thr Gln Ile Tyr Glu Asp Tyr Met Lys Leu Leu Ser Gln Gly Lys  
 50 55 60

Asp Ile Ala Glu Leu Tyr Gln Lys Tyr Ser Lys Glu Glu Leu Ala Asn  
 65 70 75 80

Leu Gly Ile Asn Ile Tyr Gln Ser Asn Asp Ile Glu Arg Thr Glu Glu  
 85 90 95

Arg Thr Phe Asp Glu Ile Ile Ser Trp Val Ser Asn Pro Tyr Ala Thr  
 100 105 110

Arg Pro Ile Gln Glu Arg His Thr Ile Gln Leu Glu Pro Thr Arg Phe  
 115 120 125

Ser Leu Glu Asp Lys Lys Arg Ile Glu Glu Ala Ala Ala Gln Gly Leu  
 130 135 140

Ser Glu Ile Asp Leu Ile Asp Leu Val Asp Leu Tyr Asp Ile Asn Leu  
 145 150 155 160

Asp Asn Thr Ser Val Asn Arg His Ile Val Gly Leu Leu Thr Asn Asn  
 165 170 175

Thr Gln Val Thr Tyr Tyr Phe Gln Glu Gln Leu Asn Lys Glu Leu Leu  
 180 185 190

115 120 125 130 135 140 145 150 155 160 165 170 175 180 185 190

Ser Met Ala His Ala Leu Asp Asn Val Gln Gln Ala Phe Ile Lys Leu  
 195 200 205

Leu Ser Glu Glu Glu Ile Arg Lys Phe Ala Leu  
 210 215

<210> 27

<211> 653

<212> DNA

<213> Streptococcus agalactiae

<400> 27

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 tcacaagtta ctactgaatc tttgtcaaaa gcagataaag ttgcggtagc caaaaaatca 180  
 aaaatgacta aggcgacatc taaatcaaaa gtagaagatg taaaacaggc tccaaaacct 240  
 tctcaggcat ctaatgaagc cccaaaatca agttctcaat ctacagaagc taattctcag 300  
 caacaagtta ctgcgagtga agaggcggct gtagaacaag cagttgtaac agaaaatacc 360  
 cctgctacca gtcaggcaca acaaacttat gctgttactg agacaactta caaacctgct 420  
 caacaccaga caagtggcca agtattgagc aatggaaata ctgcaggggc ggtcggatct 480  
 gctgctgcag cacaaatggc tgctgcaaca ggagtcacct agtctacttg ggaacatatt 540  
 attgcccggtg aatcaaatgg taatcctaag gttgctaag cctcaggggc ttcaggactt 600  
 ttccaaacga tgccagggtg gggttcaaca gctacagttc aggatcaagt taa 653

<210> 28

<211> 234

<212> PRT

<213> Streptococcus agalactiae

<400> 28

Met Asn Lys Arg Arg Lys Leu Ser Lys Leu Asn Val Lys Lys Gln His  
 1 5 10 15

Leu Ala Tyr Gly Ala Ile Thr Leu Val Ala Leu Phe Ser Cys Ile Leu  
 20 25 30

Ala Val Thr Val Ile Phe Lys Ser Ser Gln Val Thr Thr Glu Ser Leu  
 35 40 45

Ser Lys Ala Asp Lys Val Arg Val Ala Lys Lys Ser Lys Met Thr Lys  
 50 55 60

Ala Thr Ser Lys Ser Lys Val Glu Asp Val Lys Gln Ala Pro Lys Pro  
 65 70 75 80

Ser Gln Ala Ser Asn Glu Ala Pro Lys Ser Ser Ser Gln Ser Thr Glu  
 85 90 95

Ala Asn Ser Gln Gln Gln Val Thr Ala Ser Glu Glu Ala Ala Val Glu  
 100 105 110

Gln Ala Val Val Thr Glu Asn Thr Pro Ala Thr Ser Gln Ala Gln Gln  
 115 120 125

Thr Tyr Ala Val Thr Glu Thr Thr Tyr Lys Pro Ala Gln His Gln Thr  
 130 135 140

Ser Gly Gln Val Leu Ser Asn Gly Asn Thr Ala Gly Ala Val Gly Ser  
 145 150 155 160

Ala Ala Ala Ala Gln Met Ala Ala Ala Thr Gly Val Pro Gln Ser Thr  
 165 170 175

Trp Glu His Ile Ile Ala Arg Glu Ser Asn Gly Asn Pro Asn Val Ala  
 180 185 190

Asn Ala Ser Gly Ala Ser Gly Leu Phe Gln Thr Met Pro Gly Trp Gly  
 195 200 205

Ser Thr Ala Thr Val Gln Asp Gln Val Asn Ser Ala Ile Lys Ala Tyr  
 210 215 220

Arg Ala Gln Gly Leu Ser Ala Trp Gly Tyr  
 225 230

<210> 29  
 <211> 360  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 29  
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 atttccaatc ccaagcgtca gatgtctttt ttaacagggc gatgggcagc aaaagaggct 180  
 tatagcaaag cacttggaac aggaattggg aaagttaatt ttcatgatat cgaaatttta 240  
 tcggatgata aaggagcgcc ttgattaca aaagaaccgt ttaatggaaa atcttttggt 300  
 tcaatatctc atagtggtaa ttatgcacaa gctagtgtta ttttggagga agaaaaatga 360

<210> 30  
 <211> 119  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 30  
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 Lys Ala Tyr Glu Arg Asn Gln Arg Phe Ala Glu Arg Val Leu Thr Glu  
 20 25 30  
 Gln Glu Leu Leu Leu Phe Lys Gly Ile Ser Asn Pro Lys Arg Gln Met  
 35 40 45  
 Ser Phe Leu Thr Gly Arg Trp Ala Ala Lys Glu Ala Tyr Ser Lys Ala  
 50 55 60  
 Leu Gly Thr Gly Ile Gly Lys Val Asn Phe His Asp Ile Glu Ile Leu  
 65 70 75 80

Ser Asp Asp Lys Gly Ala Pro Leu Ile Thr Lys Glu Pro Phe Asn Gly  
                   85                  90                  95

Lys Ser Phe Val Ser Ile Ser His Ser Gly Asn Tyr Ala Gln Ala Ser  
                   100                  105                  110

Val Ile Leu Glu Glu Glu Lys  
                   115

<210> 31

<211> 474

<212> DNA

<213> Streptococcus agalactiae

<400> 31

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 tacatgaaag aagctgagat tggtatcaca catggcggcc cagcgacgtt tatgtcagtt 240  
 atttctttag ggaaattacc agttgttggt cctaggagaa agcagtttgg tgaacatata 300  
 aatgatcatc aaatacaatt tttaaaaaaa attgcccacc tgtatccctt ggcttggatt 360  
 gaagatgtag atggacttgc ggaagcgttg aaaaggaata tagctacaga aaaatatcag 420  
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<210> 32

<211> 157

<212> PRT

<213> Streptococcus agalactiae

<400> 32

Met Ile Phe Val Thr Val Gly Thr His Glu Gln Gln Phe Asn Arg Leu  
           1                  5                  10                  15

Ile Lys Glu Val Asp Arg Leu Lys Gly Thr Gly Ala Ile Asp Gln Glu  
           20                  25                  30

Val Phe Ile Gln Thr Gly Tyr Ser Asp Phe Glu Pro Gln Asn Cys Gln  
 35 40 45

Trp Ser Lys Phe Leu Ser Tyr Asp Asp Met Asn Ser Tyr Met Lys Glu  
 50 55 60

Ala Glu Ile Val Ile Thr His Gly Gly Pro Ala Thr Phe Met Ser Val  
 65 70 75 80

Ile Ser Leu Gly Lys Leu Pro Val Val Val Pro Arg Arg Lys Gln Phe  
 85 90 95

Gly Glu His Ile Asn Asp His Gln Ile Gln Phe Leu Lys Lys Ile Ala  
 100 105 110

His Leu Tyr Pro Leu Ala Trp Ile Glu Asp Val Asp Gly Leu Ala Glu  
 115 120 125

Ala Leu Lys Arg Asn Ile Ala Thr Glu Lys Tyr Gln Gly Asn Asn Asp  
 130 135 140

Met Phe Cys His Lys Leu Glu Lys Ile Ile Gly Glu Ile  
 145 150 155

<210> 33

<211> 1203

<212> DNA

<213> Streptococcus agalactiae

<400> 33

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 gttagcacta gccaagcagg attagcaacg gggatttata ttgtaggac tttgattgct 180  
 cgtcttatat ttggtaagca attagaagtt ctaggacgta agttagtttt acgtggaggg 240  
 gctattttttt acttactaac aacttttagct tattttttata tgccaagtat cggagtaatg 300  
 tatttagttc gtttcctaaa tgggttttgggt tatggggtcg tgtcaacagc aactaatact 360

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catattaact ttaaaatggt tattgtatta tgtagtattt taattgcat tgtagtggtg 540
ggagcatttg ttttccagc caaaaatatt actttaaatc cagaacagtt agctaaatca 600
aaatcatgga ctattgatag ttccattgag aaaaaagcaa tttttatcac aattattgca 660
tttttgatgg gtatctccta tgcttccgtg ttaggtttcc aaaaattata tacaacagaa 720
attaatttga tgacagtagg agcttatttc tttattgttt atgcacttgt catcacttta 780
accagaccat ctatgggaag attaatggac gctaaggagg ataagtgggt gctttatcca 840
agttatctgt tcttaacttt gggacttgct ttattaggga gtgctatggg aagtgttacc 900
taccttctat caggtgcttt gattggtttt ggttatggca cctttatgtc ttgtggccaa 960
gcagcatcaa tcaaaggtgt tgaggaacat cgtttcaata cagccatgtc aacttacatg 1020
ataggtcttg atttagggtt aggtgctgga ccttacattt tgggacttgt taaagatggg 1080
tttcttgagg ctggtgtgca atcctttaga gaattattct ggatagcagc gattattcct 1140
gttgtttgtg gtattctata tttcttaaaa tcatctagac aagttgaaac taaaactata 1200
taa 1203

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<210> 34

<211> 400

<212> PRT

<213> Streptococcus agalactiae

<400> 34

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Met Glu Asp Lys Leu Phe Asn Lys His Phe Ile Gly Ile Thr Ile Leu
  1             5             10             15

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Asn Phe Ile Val Tyr Met Val Tyr Tyr Leu Phe Thr Val Ile Ile Ala
      20             25             30

```

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Phe Ile Ala Thr Lys Glu Leu Gly Val Ser Thr Ser Gln Ala Gly Leu
      35             40             45

```

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Ala Thr Gly Ile Tyr Ile Val Gly Thr Leu Ile Ala Arg Leu Ile Phe
      50             55             60

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Gly Lys Gln Leu Glu Val Leu Gly Arg Lys Leu Val Leu Arg Gly Gly
      65             70             75             80

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Ala Ile Phe Tyr Leu Leu Thr Thr Leu Ala Tyr Phe Tyr Met Pro Ser  
85 90 95

Ile Gly Val Met Tyr Leu Val Arg Phe Leu Asn Gly Phe Gly Tyr Gly  
100 105 110

Val Val Ser Thr Ala Thr Asn Thr Ile Val Thr Ala Tyr Ile Pro Ala  
115 120 125

Asp Lys Arg Gly Glu Gly Ile Asn Phe Tyr Gly Leu Ser Thr Ser Leu  
130 135 140

Ala Ala Ala Ile Gly Pro Phe Val Gly Thr Phe Met Leu Asp Asn Leu  
145 150 155 160

His Ile Asn Phe Lys Met Val Ile Val Leu Cys Ser Ile Leu Ile Ala  
165 170 175

Ile Val Val Leu Gly Ala Phe Val Phe Pro Val Lys Asn Ile Thr Leu  
180 185 190

Asn Pro Glu Gln Leu Ala Lys Ser Lys Ser Trp Thr Ile Asp Ser Phe  
195 200 205

Ile Glu Lys Lys Ala Ile Phe Ile Thr Ile Ile Ala Phe Leu Met Gly  
210 215 220

Ile Ser Tyr Ala Ser Val Leu Gly Phe Gln Lys Leu Tyr Thr Thr Glu  
225 230 235 240

Ile Asn Leu Met Thr Val Gly Ala Tyr Phe Phe Ile Val Tyr Ala Leu  
245 250 255

Val Ile Thr Leu Thr Arg Pro Ser Met Gly Arg Leu Met Asp Ala Lys  
260 265 270

Gly Asp Lys Trp Val Leu Tyr Pro Ser Tyr Leu Phe Leu Thr Leu Gly  
275 280 285

Leu Ala Leu Leu Gly Ser Ala Met Gly Ser Val Thr Tyr Leu Leu Ser  
 290 295 300

Gly Ala Leu Ile Gly Phe Gly Tyr Gly Thr Phe Met Ser Cys Gly Gln  
 305 310 315 320

Ala Ala Ser Ile Lys Gly Val Glu Glu His Arg Phe Asn Thr Ala Met  
 325 330 335

Ser Thr Tyr Met Ile Gly Leu Asp Leu Gly Leu Gly Ala Gly Pro Tyr  
 340 345 350

Ile Leu Gly Leu Val Lys Asp Gly Phe Leu Gly Ala Gly Val Gln Ser  
 355 360 365

Phe Arg Glu Leu Phe Trp Ile Ala Ala Ile Ile Pro Val Val Cys Gly  
 370 375 380

Ile Leu Tyr Phe Leu Lys Ser Ser Arg Gln Val Glu Thr Lys Thr Ile  
 385 390 395 400

<210> 35

<211> 393

<212> DNA

<213> Streptococcus agalactiae

<400> 35

atgaatagtg aacctaanaag tcagtcaaac gaagtaaaaa atagcaagca atcagaagtg 60  
 aagaaagata aaaaaatgac aaaaaaagaa caattagcct atctcaaaga gcatgagcaa 120  
 gaaatcatag attatgtaaa attacataac aaccaaattg agtccggttca attogattgg 180  
 tcaagtgtaa aagtagaaca aagcgggaat ggaactccac aaggggggtga ttataatott 240  
 tcaatgagag gaaagttaa tcattacaaa aattcaaaaat taatagttga tttttattta 300  
 gctcataaaa atgatatccc aaatatcaaa tcaatgggaa tgctaaataa gccatatata 360

cataaaaatg gtatttggca catttatgaa tag

393

&lt;210&gt; 36

&lt;211&gt; 137

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 36

Met Ile Leu Gly Gly Cys Gln Met Asn Ser Glu Pro Lys Ser Gln Ser  
 1 5 10 15

Asn Glu Val Lys Asn Ser Lys Gln Ser Glu Val Lys Lys Asp Lys Lys  
 20 25 30

Met Thr Lys Lys Glu Gln Leu Ala Tyr Leu Lys Glu His Glu Gln Glu  
 35 40 45

Ile Ile Asp Tyr Val Lys Leu His Asn Asn Gln Ile Glu Ser Val Gln  
 50 55 60

Phe Asp Trp Ser Ser Val Lys Val Glu Gln Ser Gly Asn Gly Thr Pro  
 65 70 75 80

Gln Gly Gly Asp Tyr Asn Leu Ser Leu Arg Gly Lys Phe Asn His Leu  
 85 90 95

Gln Asn Ser Lys Leu Ile Val Asp Phe Tyr Leu Ala His Lys Asn Asp  
 100 105 110

Ile Pro Asn Ile Lys Ser Met Gly Met Leu Asn Lys Pro Tyr Ile His  
 115 120 125

Lys Asn Gly Ile Trp His Ile Tyr Glu  
 130 135

&lt;210&gt; 37

&lt;211&gt; 927

&lt;212&gt; DNA

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 37

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atgaaaaaga ttcgattatc aaagtttatt aaaatgattg ttgttatttt gtttttaatt 60
agtgtagcag ctagttttta ttttttccac gttgcccag ttcgagatga taaatccttt 120
atttcaaata gtcaacgtaa gcttggaac tctttatatg cttatgataa atcctttgat 180
aagctattaa agcaaaaaat agaaatgaca aacaaaaata taaagcaagt tgcttggtat 240
gttctgtctg ctaagaaaac tcataagaca gttgttgtcg ttcattggtt tgccaatagc 300
aaagagaata tgaaggcata tgggttgctg tttcataagt taggatacaa tgttcttatg 360
cctgacaaca ttgcacatgg tgaaagtcac gggcagttga taggctatgg ctggaacgac 420
cgcgagaaca ttatcaaatg gacagaaatg atagtggata agaattccatc aagccaaatt 480
actttatttg gtgtttcaat ggggtggagca acagtcacga tggctagtgg tgaaaaatta 540
cctagtcagg ttgttaatat cattgaagat tgtggttatt ctagtgtttg ggatgaatta 600
aaatttcagg ctaaagagat gtatggttta ccagccttcc cactcttata tgaagtttca 660
acaatttcta aaatcagagc aggtttttcg tatggacaag caagtagtgt cgaacaattg 720
aaaaagaata atttaccagc cctctttatt catggtgata aggataattt tgttccaaca 780
agtatggttt atgacaacta taaagctaca gcaggtaaga aagagcttta tattgtaaaa 840
ggggcaaac atgcgaaatc ttttgaaaca gagccagaaa aatatgagaa acgtatctct 900
agttttttga aaaaatatga aaaataa                                     927

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&lt;210&gt; 38

&lt;211&gt; 308

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 38

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Met Lys Lys Ile Arg Leu Ser Lys Phe Ile Lys Met Ile Val Val Ile
  1              5              10             15

Leu Phe Leu Ile Ser Val Ala Ala Ser Phe Tyr Phe Phe His Val Ala
      20              25              30

Gln Val Arg Asp Asp Lys Ser Phe Ile Ser Asn Gly Gln Arg Lys Pro
      35              40              45

```

Lys Lys Asn Asn Leu Pro Ala Leu Phe Ile His Gly Asp Lys Asp Asn  
245 250 255

Phe Val Pro Thr Ser Met Val Tyr Asp Asn Tyr Lys Ala Thr Ala Gly  
 260 265 270

Lys Lys Glu Leu Tyr Ile Val Lys Gly Ala Lys His Ala Lys Ser Phe  
 275 280 285

Glu Thr Glu Pro Glu Lys Tyr Glu Lys Arg Ile Ser Ser Phe Leu Lys  
 290 295 300

Lys Tyr Glu Lys  
 305

<210> 39

<211> 546

<212> DNA

<213> Streptococcus agalactiae

<400> 39

ttgaggagta atatggtaaa gacagcagtt ttaatggcga catacaatgg cgaaaaattt 60  
 atatctgaac aacttgattc aattcgccaa cagacattaa aaccagatta tgtattattg 120  
 agggatgatt gttcaacgga tgaaacagtc aatgtcgtca ataactatat cgcaaaacat 180  
 gagttagaag gctggaaaat tgttaaaaac gacaaaaact taggctggcg tttaaatttt 240  
 cgtoaattac ttattgatgt gttagcctat gaggttgact atgtcttttt tagtgatcaa 300  
 gatgatattt ggtatcttga taaaaacgaa cgacagtttg ccattatgtc agataaccct 360  
 caaattgagg ttttgagtgc agacgttgat atcaaaacga tgtctacaga agccagtgtt 420  
 ccacattttc taactttttc ttctagtgat agaatcagtc agtatcctaa agtatatgat 480  
 tatcaaacat tccgtcccg atggaccatt gctatgaaga gagattttgc gcaagctatc 540  
 gcttga 546

&lt;210&gt; 40

&lt;211&gt; 181

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 40

Met Arg Ser Asn Met Val Lys Thr Ala Val Leu Met Ala Thr Tyr Asn

1

5

10

15

Gly Glu Lys Phe Ile Ser Glu Gln Leu Asp Ser Ile Arg Gln Gln Thr

20

25

30

Leu Lys Pro Asp Tyr Val Leu Leu Arg Asp Asp Cys Ser Thr Asp Glu

35

40

45

Thr Val Asn Val Val Asn Asn Tyr Ile Ala Lys His Glu Leu Glu Gly

50

55

60

Trp Lys Ile Val Lys Asn Asp Lys Asn Leu Gly Trp Arg Leu Asn Phe

65

70

75

80

Arg Gln Leu Leu Ile Asp Val Leu Ala Tyr Glu Val Asp Tyr Val Phe

85

90

95

Phe Ser Asp Gln Asp Asp Ile Trp Tyr Leu Asp Lys Asn Glu Arg Gln

100

105

110

Phe Ala Ile Met Ser Asp Asn Pro Gln Ile Glu Val Leu Ser Ala Asp

115

120

125

Val Asp Ile Lys Thr Met Ser Thr Glu Ala Ser Val Pro His Phe Leu

130

135

140

Thr Phe Ser Ser Ser Asp Arg Ile Ser Gln Tyr Pro Lys Val Tyr Asp

145

150

155

160

Tyr Gln Thr Phe Arg Pro Gly Trp Thr Ile Ala Met Lys Arg Asp Phe

165

170

175

Ala Gln Ala Ile Ala

180

&lt;210&gt; 41

&lt;211&gt; 579

&lt;212&gt; DNA

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 41

atgattcatg agattcacga ttgtcaatth attgaaaaag gaagttacgt ttatttgaat 60  
 tatattaatg ctgagggcga gagagtagtt attataatca tagattttgt ccgtagtggt 120  
 agtcctatth tatatcgtct atthtatgatt ttacttgcac aagaagtacc tcacttgcac 180  
 gattacatct ataatgcaag agatgatcac tacgatactt ggaagtttaa agaattaaag 240  
 gagtcaaacc atccagtcct tttggcattc tctgaaagggt ggcacgatag tgccttgact 300  
 tctaaaagcc ttgcagaatg tttacaatta accgaccttg atgaagaagt gaaatcgacc 360  
 atcattcaat taagacagtt cgaaaaatca gtcagaaatc ctttggctca cctgattaaa 420  
 ccttttgatg agcaagaact atatcgtaca actcaattht cttctcaagc atttttagac 480  
 cagattatct tcttggcaaa ggtaattggt gttgagtatg atactgttaa ttttactac 540  
 gatacggtha acaagcttat tataaagata cttgagtaa 579

&lt;210&gt; 42

&lt;211&gt; 192

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 42

Met Ile His Glu Ile His Asp Cys Gln Phe Ile Glu Lys Gly Ser Tyr

1

5

10

15

Val Tyr Leu Asn Tyr Ile Asn Ala Glu Gly Glu Arg Val Val Ile Ile

20

25

30

Ile Ile Asp Phe Val Arg Ser Val Ser Pro Ile Leu Tyr Arg Leu Phe

35

40

45

Met Ile Leu Leu Ala Gln Glu Val Pro His Leu His Asp Tyr Ile Tyr  
 50 55 60

Asn Ala Arg Asp Asp His Tyr Asp Thr Trp Lys Phe Lys Glu Leu Lys  
 65 70 75 80

Glu Ser Asn His Pro Val Leu Leu Ala Phe Ser Glu Arg Trp His Asp  
 85 90 95

Ser Arg Leu Thr Ser Lys Ser Leu Ala Glu Cys Leu Gln Leu Thr Asp  
 100 105 110

Leu Asp Glu Glu Val Lys Ser Thr Ile Ile Gln Leu Arg Gln Phe Glu  
 115 120 125

Lys Ser Val Arg Asn Pro Leu Ala His Leu Ile Lys Pro Phe Asp Glu  
 130 135 140

Gln Glu Leu Tyr Arg Thr Thr Gln Phe Ser Ser Gln Ala Phe Leu Asp  
 145 150 155 160

Gln Ile Ile Phe Leu Ala Lys Val Ile Gly Val Glu Tyr Asp Thr Val  
 165 170 175

Asn Phe His Tyr Asp Thr Val Asn Lys Leu Ile Ile Lys Ile Leu Glu  
 180 185 190

<210> 43

<211> 465

<212> DNA

<213> Streptococcus agalactiae

<400> 43

atggtaaaag tttcaaattt aggttatcca cgtcttggtg aacagcgcca atggaagcaa 60  
 gogatcgaag ctttctgggc agggaatctt gaacaaaaag atttagaaaa acaactaaaa 120  
 caattacgta tcaatcattt aaagaaacaa aaagaggcag gtattgacct tattccagt 180

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<210> 44
<211> 159
<212> PRT
<213> Streptococcus agalactiae
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<400> 44
Met Glu Glu Ile Met Val Lys Val Ser Asn Leu Gly Tyr Pro Arg Leu
  1                   5                   10                   15

Gly Glu Gln Arg Glu Trp Lys Gln Ala Ile Glu Ala Phe Trp Ala Gly
                20                   25                   30

Asn Leu Glu Gln Lys Asp Leu Glu Lys Gln Leu Lys Gln Leu Arg Ile
                35                   40                   45

Asn His Leu Lys Lys Gln Lys Glu Ala Gly Ile Asp Leu Ile Pro Val
  1                   50                   55                   60

Gly Asp Phe Ser Cys Tyr Asp His Val Leu Asp Leu Ser Phe Gln Phe
  65                   70                   75                   80

Asn Val Ile Pro Lys Arg Phe Asp Glu Tyr Glu Arg Asn Leu Asp Leu
                85                   90                   95

Tyr Phe Ala Ile Ala Arg Gly Asp Lys Asp Asn Val Ala Ser Ser Met
                100                   105                   110

Lys Lys Trp Phe Asn Thr Asn Tyr His Tyr Ile Val Pro Glu Trp Glu
                115                   120                   125

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Val Glu Thr Lys Pro His Leu Gln Asn Asn Tyr Leu Leu Asp Leu Tyr  
 130 135 140

Leu Glu Ala Arg Glu Val Val Gly Asp Lys Ala Lys Pro Val Ile  
 145 150 155

<210> 45

<211> 124

<212> DNA

<213> Streptococcus agalactiae

<400> 45

atggtgttac ttttattgct aatggtagcc aagtcaagtt tgatgggttac atggctgttt 60  
 ataacgatac tgacaaaaaat aaaatgttac cagatatgga ggaaggagaa agttatcaag 120  
 ttaa 124

<210> 46

<211> 41

<212> PRT

<213> Streptococcus agalactiae

<400> 46

Met Val Leu Leu Leu Leu Leu Met Val Ala Lys Ser Ser Leu Met Val  
 1 5 10 15

Thr Trp Leu Phe Ile Thr Ile Leu Thr Lys Ile Lys Cys Tyr Gln Ile  
 20 25 30

Trp Arg Lys Glu Lys Val Ile Lys Leu  
 35 40

&lt;210&gt; 47

&lt;211&gt; 669

&lt;212&gt; DNA

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 47

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atgaacaaaa aaatttccgg gatcggcttg gcttogattg cagtacttag tttagctgca 60
tgtggacatc gtggtgcttc taaatctggt ggtaaatacag atagcttgaa gggtgcaatg 120
gtaacagata ccggtggtgt tgatgataaa tcatttaacc aatctgggtg ggaaggatatg 180
caagcttggg gcaagaagaa tggccttaaa aaaggagctg gttttgacta tttccaatcg 240
gcaagtgaat ctgattatgc aactaactta gatacagctg tgtctagtgg ttataaattg 300
attttcgcta ttggattttc tcttcatgat gctattgata aagcagcaga caataacaaa 360
gatgttaatt acgtcatcgt tgatgatgtt attaaagga aagataatgt tgcaagtgtt 420
gtctttgcgg ataatgaatc agcttactta gcaggatttg cagccgctaa aactacccaa 480
acaaaaacag ttggctttgt aggtggtatg gaatctgagg ttattaccog ttttgaaaaa 540
ggttttgaag cagggtgtcaa atcagttgat aaatcaatta aaattaaagt tgactatgct 600
ggttcattcg gtgatgctgc taagggttaag acaattgcag ccgcacaata tgcttctggc 660
gcagatatatt

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&lt;210&gt; 48

&lt;211&gt; 223

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 48

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Met Asn Lys Lys Ile Ser Gly Ile Gly Leu Ala Ser Ile Ala Val Leu
  1              5              10              15

Ser Leu Ala Ala Cys Gly His Arg Gly Ala Ser Lys Ser Gly Gly Lys
          20              25              30

Ser Asp Ser Leu Lys Val Ala Met Val Thr Asp Thr Gly Gly Val Asp
          35              40              45

Asp Lys Ser Phe Asn Gln Ser Gly Trp Glu Gly Met Gln Ala Trp Gly
          50              55              60

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Lys Lys Asn Gly Leu Lys Lys Gly Ala Gly Phe Asp Tyr Phe Gln Ser  
 65 70 75 80

Ala Ser Glu Ser Asp Tyr Ala Thr Asn Leu Asp Thr Ala Val Ser Ser  
 85 90 95

Gly Tyr Lys Leu Ile Phe Gly Ile Gly Phe Ser Leu His Asp Ala Ile  
 100 105 110

Asp Lys Ala Ala Asp Asn Asn Lys Asp Val Asn Tyr Val Ile Val Asp  
 115 120 125

Asp Val Ile Lys Gly Lys Asp Asn Val Ala Ser Val Val Phe Ala Asp  
 130 135 140

Asn Glu Ser Ala Tyr Leu Ala Gly Ile Ala Ala Ala Lys Thr Thr Lys  
 145 150 155 160

Thr Lys Thr Val Gly Phe Val Gly Gly Met Glu Ser Glu Val Ile Thr  
 165 170 175

Arg Phe Glu Lys Gly Phe Glu Ala Gly Val Lys Ser Val Asp Lys Ser  
 180 185 190

Ile Lys Ile Lys Val Asp Tyr Ala Gly Ser Phe Gly Asp Ala Ala Lys  
 195 200 205

Gly Lys Thr Ile Ala Ala Ala Gln Tyr Ala Ser Gly Ala Asp Ile  
 210 215 220

<210> 49

<211> 609

<212> DNA

<213> Streptococcus agalactiae

<400> 49

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tatacgagtt tacaacccaaa tcatgtagcg gctgaacaat cacaaaaaac atcaactgtt 120  
 cttatgagtc aaaaaactat tgaacataag ttaaaagttg cagataaaga agctgctcct 180  
 ctctacgcta aaatcgacca tatccaacga catattgaag tcaaaaaagc aaaagattta 240  
 aaagttattg aattgtatat taacaaagat atcaaccaac tagagaagca aaataaacgt 300  
 ctactaacta aattctatac ttctattgat aatcaaacat gggatagcac aagtgaagtc 360  
 aaaaaattga ttgataagac aaccctatcc actaacgaaa aagatagatt aaaattatat 420  
 tttgaacaac gtgcttacct tgagacaagg ttgaacgacc gctatcaaaa atttgataac 480  
 totattgaaa accaaaataa agaactaaaa atattaacgt caaaaataga aaaaatctat 540  
 caaaaacatg gtattacaaa agagggtatta aaaacttact atgctaaaaa aacagtacga 600  
 gctgactga 609

<210> 50

<211> 202

<212> PRT

<213> Streptococcus agalactiae

<400> 50

Met Leu His Ser Lys Lys Ile His Ser Leu Ser Leu Ile Ala Val Leu  
 1 5 10 15

Ser Leu Ala Thr Tyr Thr Ser Leu Gln Pro Asn His Val Ala Ala Glu  
 20 25 30

Gln Ser Gln Lys Thr Ser Thr Val Leu Met Ser Gln Lys Thr Ile Glu  
 35 40 45

His Lys Leu Lys Val Ala Asp Lys Glu Ala Ala Pro Leu Tyr Ala Lys  
 50 55 60

Ile Asp His Ile Gln Arg His Ile Glu Val Lys Lys Ala Lys Asp Leu  
 65 70 75 80

Lys Val Ile Glu Leu Tyr Ile Asn Lys Asp Ile Asn Gln Leu Glu Lys  
 85 90 95

Gln Asn Lys Arg Leu Leu Thr Lys Phe Tyr Thr Ser Ile Asp Asn Gln  
 100 105 110

Thr Trp Asp Ser Thr Ser Glu Val Lys Lys Leu Ile Asp Lys Thr Thr  
 115 120 125

Leu Ser Thr Asn Glu Lys Asp Arg Leu Lys Leu Tyr Phe Glu Gln Arg  
 130 135 140

Ala Tyr Leu Glu Thr Arg Leu Asn Asp Arg Tyr Gln Lys Phe Asp Asn  
 145 150 155 160

Ser Ile Glu Asn Gln Asn Lys Glu Leu Lys Ile Leu Thr Ser Lys Ile  
 165 170 175

Glu Lys Ile Tyr Gln Lys His Gly Ile Thr Lys Glu Val Leu Lys Thr  
 180 185 190

Tyr Tyr Ala Lys Lys Thr Val Arg Ala Asp  
 195 200

<210> 51

<211> 600

<212> DNA

<213> Streptococcus agalactiae

<400> 51

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 tatgcattca tggttactaa agagtttgcc agacagaata aaatcaccaa gatctctgat 120  
 ctcaaaaagt tatcaacaac tatgaaggca ggggttgata gttcatggat gaatcgcgag 180  
 ggagatggat aactgattt cgctaaaaca tacgggtttg aattttcaca tatttaccct 240  
 atgcaaattg gcttagtcta tgatgcggtt gaaagtaaca aaatgcaatc tgtattaggc 300  
 tactccactg acggtcgtat ttcgagctat gatttagaaa ttttaaggga tgataaaaaa 360  
 ttcttttctc cttatgaagc ctctatgggt gtcaacaatt ctatcatcaa aaaagatcct 420  
 aaactaaaaa aattactcca tcgactcgat ggtaaaatca atttaaaaac gatgcaaaac 480  
 cttaattata tggtagatga taaactttta gaagcttggc gtaatcatgg tcatagctgt 540  
 ttctgtgtg aaattgttat ccgctcacia ttccacacia catacgagcc ggaagcataa 600

<213> Streptococcus agalactiae

Leu Asn Tyr Met Val Asp Asp Lys Leu Leu Glu Ala Trp Arg Asn His  
165 170 175

Gly His Ser Cys Phe Leu Cys Glu Ile Val Ile Arg Ser Gln Phe His  
 180 185 190

Thr Thr Tyr Glu Pro Glu Ala  
 195

<210> 53

<211> 849

<212> DNA

<213> Streptococcus agalactiae

<400> 53

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 agtaaagaaa aggtgattac tgttgcaact tacagcaaac ctacatctac ctttttagat 180  
 ttgattaaag ataatgtaaa agaaaaagga tatactttta aggttgatcat ggtctctgac 240  
 tatattcagg ctaacattgc tttagaaaac aaagaacatg atgctaacct tttacaacat 300  
 gaatttttca tgagtatctt taataaggaa aatgatgggc atctagtgtc aattacacca 360  
 atttatcatt cattggctgg tttttatggt caacatttga aaaatattgc cgagcttaaa 420  
 gacggtgcta aggtagcgat tccgtctgat cctgccataa tgactagagc tctgctatta 480  
 ttgcaagaaa agaaacttat caccttaaag aatacgtcca aaaagaccaa ggctatcgaa 540  
 gatattatta ctaaccctaa aaaattacga attgaacctg tagcattact taacctcaat 600  
 caggcctatt ttgaatatga ccttgtcttt aatttccctg gatatgtgac aaaaatcaat 660  
 ctagttccta aaagggatag attattatat gagaaaaaac cagatatccg ttttgcaggt 720  
 gccttggtag ctcgtgaaga taataaaaat agtgataaaa taaaagtact taaagaagta 780  
 ctaacaagta aagagattcg tcaatatatc actaaggaga ttccaagtga agcagacgtt 840  
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<210> 54

<211> 282

<212> PRT

<213> Streptococcus agalactiae

<400> 54

Met Lys Lys Leu Leu Ser Leu Thr Cys Leu Ile Met Met Ser Leu Cys  
 1 5 10 15

Val Phe Asn Phe Pro Gly Tyr Val Thr Lys Ile Asn Leu Val Pro Lys  
210 215 220

Arg Asp Arg Leu Leu Tyr Glu Lys Lys Pro Asp Ile Arg Phe Ala Gly  
 225 230 235 240

Ala Leu Val Ala Arg Glu Asp Asn Lys Asn Ser Asp Lys Ile Lys Val  
 245 250 255

Leu Lys Glu Val Leu Thr Ser Lys Glu Ile Arg His Tyr Ile Thr Lys  
 260 265 270

Glu Ile Pro Ser Glu Ala Asp Val Ala Phe  
 275 280

<210> 55

<211> 711

<212> DNA

<213> Streptococcus agalactiae

<400> 55

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 gctttatatt tacaaggta taatgttgct aaaatgaagt tagatgattg gttacaaaag 120  
 cccagtgaag aaccatattc aattatctta gatttagatg aaacagtttt agataatagc 180  
 ccatatcaag caaagaatat taaagatggc tctagtttca cgccagagag ttgggataaa 240  
 tgggtgcaaa agaaatcagc taaggctggt gcgggtgcc aagaattttt gaagtatgct 300  
 aatgaaaagg gaataaaaat ttattatgtc tcagatcgta cagatgctca agttgatgctg 360  
 actaaagaaa atttagagaa ggaaggtata cctgttcaag ggaaagacca cttgcttttc 420  
 cttaaaaaag gaatgaaatc taaagagagt cgccgtcagg cagttcaaaa agataaccaat 480  
 ttaattatgc tttttggaga taatttagtt gattttgctg atttttctaa atcatctagt 540  
 acagatagag aacaactact aactaaactt caaagtgagt ttggtagtaa atttattggt 600  
 ttoccaaata ctatgtacgg ttcttgggaa agtgctatatt atcaaggaaa acatctggat 660  
 gttcaaaaac aattgaaaga acgacaaaaa atgttgcat cgtatgatta a 711

<210> 56

<211> 236

<212> PRT

<213> Streptococcus agalactiae

Leu	Leu	Ala	Lys	Glu	Thr	Thr	Met	Ser	Val	Leu	Trp	Tyr	Gln	Asn	Ser
1				5				10						15	
Ala	Glu	Ala	Lys	Ala	Leu	Tyr	Leu	Gln	Gly	Tyr	Asn	Val	Ala	Lys	Met
			20					25					30		
Lys	Leu	Asp	Asp	Trp	Leu	Gln	Lys	Pro	Ser	Glu	Lys	Pro	Tyr	Ser	Ile
		35					40					45			
Ile	Leu	Asp	Leu	Asp	Glu	Thr	Val	Leu	Asp	Asn	Ser	Pro	Tyr	Gln	Ala
	50					55					60				
Lys	Asn	Ile	Lys	Asp	Gly	Ser	Ser	Phe	Thr	Pro	Glu	Ser	Trp	Asp	Lys
65					70				75					80	
Trp	Val	Gln	Lys	Lys	Ser	Ala	Lys	Ala	Val	Ala	Gly	Ala	Lys	Glu	Phe
			85					90					95		
Leu	Lys	Tyr	Ala	Asn	Glu	Lys	Gly	Ile	Lys	Ile	Tyr	Tyr	Val	Ser	Asp
		100					105					110			
Arg	Thr	Asp	Ala	Gln	Val	Asp	Ala	Thr	Lys	Glu	Asn	Leu	Glu	Lys	Glu
		115					120					125			
Gly	Ile	Pro	Val	Gln	Gly	Lys	Asp	His	Leu	Leu	Phe	Leu	Lys	Lys	Gly
	130					135					140				
Met	Lys	Ser	Lys	Glu	Ser	Arg	Arg	Gln	Ala	Val	Gln	Lys	Asp	Thr	Asn
145					150					155					160
Leu	Ile	Met	Leu	Phe	Gly	Asp	Asn	Leu	Val	Asp	Phe	Ala	Asp	Phe	Ser
			165					170					175		
Lys	Ser	Ser	Ser	Thr	Asp	Arg	Glu	Gln	Leu	Leu	Thr	Lys	Leu	Gln	Ser
		180					185						190		
Glu	Phe	Gly	Ser	Lys	Phe	Ile	Val	Phe	Pro	Asn	Pro	Met	Tyr	Gly	Ser
		195					200					205			
Trp	Glu	Ser	Ala	Ile	Tyr	Gln	Gly	Lys	His	Leu	Asp	Val	Gln	Lys	Gln
	210					215					220				

Leu Lys Glu Arg Gln Lys Met Leu His Ser Tyr Asp

225

230

235

&lt;210&gt; 57

&lt;211&gt; 128

&lt;212&gt; DNA

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 57

atggataata aaggtaataa cgccaatgtg attgatgcaa tcgctgaggg tgcaagcaca 60  
 ggtgcacaaa tggctttctc aattgggtgct agtttgattg cctttgttgg tttagtttct 120  
 ttgattaa 128

&lt;210&gt; 58

&lt;211&gt; 42

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 58

Met Asp Asn Lys Gly Asn Asn Ala Asn Val Ile Asp Ala Ile Ala Glu  
 1 5 10 15

71

Gly Ala Ser Thr Gly Ala Gln Met Ala Phe Ser Ile Gly Ala Ser Leu  
20 25 30

Ile Ala Phe Val Gly Leu Val Ser Leu Ile  
35 40

<210> 59

<211> 573

<212> DNA

<213> Streptococcus agalactiae

<400> 59

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actttgatgc atatcccagt tattattgca tctatagcct atggacctcg tattggtgca 180  
actctaggcg ccttaatggg ggggattcagc gtagctaaca gcagcattgt tctattacca 240  
acgagttacc tcttctcacc ttttggtgaa aatggtaatt tttattcgct aattattgca 300  
cttgtaccac gtatttctaat cgggattatt ccttatttcg tttacaaatt actacacaac 360  
cgctttgggt tggctatctc aggtgctata ggctctctaa caaacacagt atttgtttta 420  
tctggaatth ttatcttttt ttcaagtact tataatggga atatcaagct aatgctcgct 480  
gggattatth catctaatto attagctgag atgggtcattg cagctatcat tgtatatcta 540  
actgatcctc gtattctcaa tattaaacat taa 573

<210> 60

<211> 190

<212> PRT

<213> Streptococcus agalactiae

<400> 60

Met Lys Lys Lys Asn Lys Ser Ser Asn Ile Ala Ile Ile Ala Ile Phe  
1 5 10 15

Phe Ala Ile Met Leu Val Ile His Phe Leu Ser Ser Phe Ile Phe Ser  
20 25 30

ttgaatatga cattacaaga cgaaatcaaa aaacgcogta cttttgccat catctctcac 60

ccggatgctg gtaagacgac tattactgag caattattat attttgggtgg tgaaattaga 120  
 gaagcagggga cagtaaaagg gaaaaaatca ggtacttttg caaagtccga ctggatggat 180  
 attgaaaagc aacgggggtat ctctgttact tcactctgta tgcaatttga ttacgcgggt 240  
 aaacgtgtta a 251

<210> 62

<211> 83

<212> PRT

<213> Streptococcus agalactiae

<400> 62

Met Asn Met Thr Leu Gln Asp Glu Ile Lys Lys Arg Arg Thr Phe Ala

1

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10

15

Ile Ile Ser His Pro Asp Ala Gly Lys Thr Thr Ile Thr Glu Gln Leu

20

25

30

Leu Tyr Phe Gly Gly Glu Ile Arg Glu Ala Gly Thr Val Lys Gly Lys

35

40

45

Lys Ser Gly Thr Phe Ala Lys Ser Asp Trp Met Asp Ile Glu Lys Gln

50

55

60

Arg Gly Ile Ser Val Thr Ser Ser Val Met Gln Phe Asp Tyr Ala Gly

65

70

75

80

Lys Arg Val

<210> 63

<211> 303

<212> DNA

<213> Streptococcus agalactiae

<400> 63

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aaaattgaaa agcctgctct ttcgtttatg caagatgcgt ggcgtcgctt gaaaaaaaaac 120

aaattagcag tagtttcact ctatttatta gctottttac ttactttttc gttagcctca 180  
 aattttatttg taactcagaa ggatgctaata gggtttgatt cgaaaaaagt aacgacatat 240  
 cgcaacttac cacctaaatt gagttcaaac cttccttttt ggaatggtag cattaatcca 300  
 tca 303

<210> 64

<211> 101

<212> PRT

<213> Streptococcus agalactiae

<400> 64

Met Ala Asp Lys Asn Arg Thr Phe Lys Leu Val Gly Ala Gly Ser Ser

1 5 10 15

Ser Thr Gln Glu Lys Ile Glu Lys Pro Ala Leu Ser Phe Met Gln Asp

20 25 30

Ala Trp Arg Arg Leu Lys Lys Asn Lys Leu Ala Val Val Ser Leu Tyr

35 40 45

Leu Leu Ala Leu Leu Leu Thr Phe Ser Leu Ala Ser Asn Leu Phe Val

50 55 60

Thr Gln Lys Asp Ala Asn Gly Phe Asp Ser Lys Lys Val Thr Thr Tyr

65 70 75 80

Arg Asn Leu Pro Pro Lys Leu Ser Ser Asn Leu Pro Phe Trp Asn Gly

85 90 95

Ser Ile Asn Pro Ser

100

<210> 65

<211> 154

<212> DNA

<213> Streptococcus agalactiae

<400> 65

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tacacaccaa taaacctagc tacaaatcat accacagaaa atattgttac tgctcaagag 120
tataaaacaa agagaatggt actttacctt ttaa                                154
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<210> 66

<211> 51

<212> PRT

<213> Streptococcus agalactiae

<400> 66

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Met Lys Arg Lys Gln Phe Ile Lys Leu Gly Ile Ala Thr Leu Leu Thr
  1              5              10             15

Val Ile Ser Leu Tyr Thr Pro Ile Asn Leu Ala Thr Asn His Thr Thr
          20              25             30

Glu Asn Ile Val Thr Ala Gln Glu Tyr Lys Thr Lys Glu Asn Ile Leu
      35              40             45

Phe Leu Leu
      50
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<210> 67

<211> 144

<212> DNA

<213> Streptococcus agalactiae

<400> 67

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atgttttata atcctttact ttttattgta ctaattacaa ttgctgtatt tttotttagct 60
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aagaaaaaat ggcaattacc gacatttact ttcattgggt tgctatttat ctataaccaa 120  
 gggctgtggg aacagttgat taat 144

<210> 68

<211> 48

<212> PRT

<213> Streptococcus agalactiae

<400> 68

Met Phe Tyr Asn Pro Leu Leu Phe Ile Val Leu Ile Thr Ile Ala Val  
 1 5 10 15

Phe Phe Leu Ala Lys Lys Lys Trp Gln Leu Pro Thr Phe Thr Phe Ile  
 20 25 30

Gly Leu Leu Phe Ile Tyr Asn Gln Gly Leu Trp Glu Gln Leu Ile Asn  
 35 40 45

<210> 69

<211> 453

<212> DNA

<213> Streptococcus agalactiae

<400> 69

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 agcaagcaat cagaagtga gaaagataaa aaaatgacaa aaaaagaaca attagcttat 180  
 ctcaaagagc atgaacaaga aataattgat tttgtaaaat ctcagaataa aaagatagaa 240  
 tctgtacaaa ttgattggaa tgatgttcga tggagtaaag ggggaaatgg tacacctcaa 300  
 ggaggaggag aggggatttt actttttggg gagattaata atgattctga atcaagttgg 360  
 agagttgata ttgatataga aaaaggacgg ctagacctaa aaaatatgta tttaggacaa 420  
 cctatacgaa ttggaggtaa attatgtgag taa 453

&lt;210&gt; 70

&lt;211&gt; 150

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 70

Met Val Gln Ile Met Lys Lys His Ile Lys Ser Ile Ile Pro Ile Val

1

5

10

15

Leu Ile Gly Met Ile Leu Gly Gly Cys Gln Met Asn Ser Glu His Lys

20

25

30

Ser Gln Tyr Asn Glu Thr Lys Ser Ser Lys Gln Ser Glu Val Lys Lys

35

40

45

Asp Lys Lys Met Thr Lys Lys Glu Gln Leu Ala Tyr Leu Lys Glu His

50

55

60

Glu Gln Glu Ile Ile Asp Phe Val Lys Ser Gln Asn Lys Lys Ile Glu

65

70

75

80

Ser Val Gln Ile Asp Trp Asn Asp Val Arg Trp Ser Lys Gly Gly Asn

85

90

95

Gly Thr Pro Gln Gly Gly Gly Glu Gly Ile Leu Leu Phe Gly Glu Ile

100

105

110

Asn Asn Asp Ser Glu Ser Ser Trp Arg Val Asp Ile Asp Ile Glu Lys

115

120

125

Gly Arg Leu Asp Leu Lys Asn Met Tyr Leu Gly Gln Pro Ile Arg Ile

130

135

140

Gly Gly Lys Leu Phe Glu

145

150

&lt;210&gt; 71

&lt;211&gt; 1455

&lt;212&gt; DNA

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 71

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atggaatttt tggcttataa tgctttcaca gcaatcgggtg tttctattcc gcacggtaat 60
catttccact ttattcacta taaggatatg tctccattag agttagaagc aacaaggatg 120
gtggcagagc atagaggaca tcatattgat gcattagga aaaaagattc tacagagaaa 180
ccaaagcata tttctcatga acctaataag gaacctcaca cagaggaaga acaccatgca 240
gtaacaccga aagaccaacg taaaggcaaa ccaaatagcc agattgtcta cagtgtctca 300
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gctaaagata ttaaaaaaga tacaggtaaa gggtatgtca ttccacatat gacacatgag 420
cattgggtac caaagaaaga tttatcagag tcggaattaa aagcagctca agaatttctt 480
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tatgaggcaa ttgaaccaa agcaattggt aaacctgaag atttattatt tggaattgca 600
caagcgacag actataagaa tgggtacattt gtaattcctc ataaagatca ttaccattat 660
gtggaattaa aatggtttga tgaagaaaaa gatcttttag ctgattcaga taagacatat 720
tctttagaag actattttagc tacggctaaa tattacatga tgcaccaga aaaacgtcct 780
aaagttgaag gatggggtaa agatgotgaa atttataagg aaaaggactc taataaagca 840
gataaaccaa gtcctgcacc aactgataat aaatcaacat caaattctag tgacaaaaac 900
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1455

&lt;210&gt; 72

&lt;211&gt; 485

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

Met Glu Phe Leu Ala Tyr Asn Ala Phe Thr Ala Ile Gly Val Ser Ile  
1 5 10 15

Leu Glu Leu Glu Ala Thr Arg Met Val Ala Glu His Arg Gly His His  
35 40 45

Ser His Glu Pro Asn Lys Glu Pro His Thr Glu Glu Glu His His Ala  
65 70 75 80

Val Thr Pro Lys Asp Gln Arg Lys Gly Lys Pro Asn Ser Gln Ile Val  
85 90 95

Tyr Ser Ala Gln Glu Ile Glu Glu Ala Lys Lys Ala Gly Lys Tyr Thr  
100 105 110

Thr Ser Asp Gly Tyr Ile Phe Asp Ala Lys Asp Ile Lys Lys Asp Thr  
115 120 125

Gly Thr Gly Tyr Val Ile Pro His Met Thr His Glu His Trp Val Pro  
130 135 140

Lys Lys Asp Leu Ser Glu Ser Glu Leu Lys Ala Ala Gln Glu Phe Leu  
145 150 155 160

Ser Gly Lys Ser Glu Ala Asn Gln Asp Lys Pro Lys Thr Gly Lys Thr  
165 170 175

Ala Gln Glu Ile Tyr Glu Ala Ile Glu Pro Lys Ala Ile Val Lys Pro  
180 185 190

Glu Asp Leu Leu Phe Gly Ile Ala Gln Ala Thr Asp Tyr Lys Asn Gly  
 195 200 205

Thr Phe Val Ile Pro His Lys Asp His Tyr His Tyr Val Glu Leu Lys  
 210 215 220

Trp Phe Asp Glu Glu Lys Asp Leu Leu Ala Asp Ser Asp Lys Thr Tyr  
 225 230 235 240

Ser Leu Glu Asp Tyr Leu Ala Thr Ala Lys Tyr Tyr Met Met His Pro  
 245 250 255

Glu Lys Arg Pro Lys Val Glu Gly Trp Gly Lys Asp Ala Glu Ile Tyr  
 260 265 270

Lys Glu Lys Asp Ser Asn Lys Ala Asp Lys Pro Ser Pro Ala Pro Thr  
 275 280 285

Asp Asn Lys Ser Thr Ser Asn Ser Ser Asp Lys Asn Leu Ser Ala Ala  
 290 295 300

Glu Val Phe Lys Gln Ala Lys Pro Glu Lys Ile Val Pro Leu Asp Lys  
 305 310 315 320

Ile Ala Ala His Met Ala Tyr Ala Val Gly Phe Glu Asp Asp Gln Leu  
 325 330 335

Ile Val Pro His His Asp His Tyr His Asn Val Pro Met Ala Trp Phe  
 340 345 350

Asp Lys Gly Gly Leu Trp Lys Ala Pro Glu Gly Tyr Thr Leu Gln Gln  
 355 360 365

Leu Phe Ser Thr Ile Lys Tyr Tyr Met Glu His Pro Asn Glu Leu Pro  
 370 375 380

Lys Glu Lys Gly Trp Gly His Asp Ser Asp His Asn Lys Gly Ser Asn  
 385 390 395 400

1189610-4446360

Lys Asp Asn Lys Ala Lys Asn Tyr Ala Pro Asp Glu Glu Pro Glu Asp  
 405 410 415

Ser Gly Lys Val Thr His Asn Tyr Gly Phe Tyr Asp Val Asn Lys Gly  
 420 425 430

Ser Asp Glu Glu Glu Pro Glu Lys Gln Glu Asp Glu Ser Glu Leu Asp  
 435 440 445

Glu Tyr Glu Leu Gly Met Ala Gln Asn Ala Lys Lys Tyr Gly Met Asp  
 450 455 460

Arg Gln Ser Phe Glu Lys Gln Leu Ile Gln Leu Ser Asn Lys Tyr Ser  
 465 470 475 480

Val Ser Phe Glu Ser  
 485

<210> 73

<211> 855

<212> DNA

<213> Streptococcus agalactiae

<400> 73

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 gatcattggg acatttgtaa cgcatttgat tttccgtatt tacatcgctt tgatctcatt 180  
 aaaggtaaag aaaatcaact ttactttata ggttgtaaaa ttgctaacag taaagcctac 240  
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 gatgtggtga aagtggatat taatcaggat ggtaaggatg agtatgtgat catccaaggt 540  
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cacttggttt cagaattagt agatgcaaaa gcagcttcta gtaatgtott agcttttgaa 780  
 aaagatggaa aagcttatct tttctcagcc aataacggac gtggcgaagt tgctctttat 840  
 caattagtaa aataa 855

<210> 74

<211> 284

<212> PRT

<213> Streptococcus agalactiae

<400> 74

Met Arg Lys Arg Phe Ser Leu Leu Asn Phe Ile Val Val Thr Phe Ile  
 1 5 10 15

Phe Phe Phe Phe Ile Leu Phe Pro Leu Phe Lys Ala Lys Asp Cys Gln  
 20 25 30

Val Val Tyr Ala Ser Phe Gln Gly Asp His Trp Asp Ile Cys Asn Ala  
 35 40 45

Phe Asp Phe Pro Tyr Leu His Arg Phe Asp Leu Ile Lys Gly Lys Glu  
 50 55 60

Asn Gln Leu Tyr Phe Ile Gly Cys Thr Ile Ala Asn Ser Lys Ala Tyr  
 65 70 75 80

Thr Glu Asp Trp Ser Asp Lys Gly Arg Ile Phe Val Ala Arg Phe Asn  
 85 90 95

Thr Gln Asn His Thr Leu Glu Gly Leu Gln Gln Leu Pro Gln Thr Leu  
 100 105 110

Leu Lys Asn His Gly Tyr Tyr Ala Ile Gln Asp Glu Gly Tyr Ser Leu  
 115 120 125

Ile Thr Ser Val Glu Gly Val Leu Lys Leu Thr Tyr Pro Glu Phe Ser  
 130 135 140

Thr Thr Gly Asp Trp Gln Leu Glu Arg Leu Phe Asp Glu Glu Thr Ser  
 145 150 155 160

Asp Val Val Lys Val Asp Ile Asn Gln Asp Gly Lys Asp Glu Tyr Val  
 165 170 175

Ile Ile Gln Gly Phe His Gly Asp Arg Leu Arg Ile Phe Thr Glu Asp  
 180 185 190

Phe Gly Arg Glu Leu Phe His Tyr Pro Glu Lys Thr Pro Phe Gly His  
 195 200 205

Ala Ile Trp Ser Gly Arg Leu Leu Asn Gln Thr Cys Phe Val Phe Gly  
 210 215 220

Trp Arg Ser Glu Lys Ala Glu Leu Arg Leu Phe His Phe Val Asp Gly  
 225 230 235 240

His Leu Val Ser Glu Leu Val Asp Ala Lys Ala Ala Ser Ser Asn Val  
 245 250 255

Leu Ala Phe Glu Lys Asp Gly Lys Ala Tyr Leu Phe Ser Ala Asn Asn  
 260 265 270

Gly Arg Gly Glu Val Ala Leu Tyr Gln Leu Val Lys  
 275 280

<210> 75

<211> 2070

<212> DNA

<213> Streptococcus agalactiae

<400> 75

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aagcgtgctg gctggaatgt taacatgacg tatccagggtt ttgatgccgc agttaacgct 240  
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aaagtcttta atttctcaga tacttattac gatacttccg ttattcttta tactaaaaat 360  
aataataaag tcacaaacta caaacaacta aaaggaaaag tagtcggtgt aaaaaatgga 420  
acagctgctc aaagcttctt agaagaaaat aaatctaaat acggctataa agttaaaca 480  
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gccaatgaaa aagcaactcc tgtaaagcca agttataaaa ttgtttctga ttcttcattc 840  
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tacggcaaaa ctatgcaaaa ggttatctta cctcaagcag tacgccttat gttaccaaac 1980  
tttatcaacc aatttgtcat ctcatataag gatacaacaa ttgtatcagc aatcggactt 2040  
gtggaactct tccaaactgg taaatcataa 2070

<210> 76

<211> 689

<212> PRT

<213> Streptococcus agalactiae

Met Lys His Lys Leu Lys Ala Phe Thr Leu Ala Leu Leu Ser Ile Phe  
1 5 10 15

Asp Thr Ala Tyr Ala Pro Phe Glu Phe Lys Asp Ser Asp Gln Thr Tyr  
35 40 45

Trp Asn Val Asn Met Thr Tyr Pro Gly Phe Asp Ala Ala Val Asn Ala  
65 70 75 80

Glu Ala Arg Lys Lys Val Phe Asn Phe Ser Asp Thr Tyr Tyr Asp Thr  
100 105 110

Gln Leu Lys Gly Lys Val Val Gly Val Lys Asn Gly Thr Ala Ala Gln  
130 135 140

Ser Phe Leu Glu Glu Asn Lys Ser Lys Tyr Gly Tyr Lys Val Lys Thr  
145                    150                    155                    160

Phe Asp Thr Ser Asp Leu Met Asn Asn Ser Leu Asp Ser Gly Ser Ile  
165 170 175

Tyr Ala Ala Met Asp Asp Gln Pro Val Val Gln Phe Ala Ile Asn Gln  
180 185 190

Thr Ala Ser Tyr Thr Trp Leu Ser Asp His Ala Asp Lys Tyr Asn Tyr  
385 390 395 400

His Gln Ser Pro Ile Asn Asp Phe Val Ala Ala Thr Ile Ala Leu Ser  
595 600 605

15

Ile Gly Phe Val Ser Asn Lys Ile Gly Gly Arg Pro Asn Gln Gln Thr  
 20 25 30

Phe Gly Met Thr Leu Gly Ala Leu Leu Phe Ala Ile Ile Val Cys Leu  
 35 40 45

Phe

<210> 79

<211> 963

<212> DNA

<213> Streptococcus agalactiae

<400> 79

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 gtttatgatg atgtgacttt ctacaaattt gatgataaat attggttggc tagtcataaa 240  
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 gagtataaaa tgctgcaaatt tgaaggaaga tattcgggag aaattgctca gtcattttat 360  
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 ggtgaggaaa ggttatcttg gcgtagattt gggttttctg gagaatttgg ctatcaattt 480  
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 gggttgatga ttgttaacca aacatatgct cattcaggag ttacttttgt aacagaagat 900  
 ggccaaattt tgaaaacaca atcaagccct tattgtatcc cagaaagttg gaacaaagaa 960  
 tga 963

<213> Streptococcus agalactiae

Met Asn Thr Ile Tyr Asn Thr Leu Arg Thr Asp Lys Gly Tyr Lys Val  
1 5 10 15

Tyr Glu Gly Tyr Leu Tyr Glu Ile Thr Gly Glu Glu Cys Glu Glu Ala  
20 25 30

Leu Asp Leu Val Ile Pro Lys Asn Ile Val Phe Ala Asp Thr Asp Thr  
35 40 45

Cys Gly Tyr Thr Phe Leu Leu Asn Glu Asp Gly Thr Val Tyr Asp Asp  
50 55 60

Val Thr Phe Tyr Lys Phe Asp Asp Lys Tyr Trp Leu Ala Ser His Lys  
65 70 75 80

Ala Leu Asp Ser Tyr Leu Asp Asn Ile Asn Phe Asp Tyr Thr Val Thr  
85 90 95

Asp Ile Ser Asp Glu Tyr Lys Met Leu Gln Ile Glu Gly Arg Tyr Ser  
100 105 110

Gly Glu Ile Ala Gln Ser Phe Tyr Glu Tyr Asp Ile Ser Thr Leu Asn  
115 120 125

Phe Arg Thr Leu Arg Ile Glu Met Asp Phe Ile Lys Gly Glu Glu Arg  
130 135 140

Leu Ser Trp Arg Arg Phe Gly Phe Ser Gly Glu Phe Gly Tyr Gln Phe  
145 150 155 160

Phe Leu Pro Ser Ser Ile Phe Ala Thr Phe Val Ser Asp Val Cys Glu  
165 170 175

Gly Ile Ala Glu Cys Gly Asp Glu Leu Asp Arg Tyr Leu Arg Phe Glu  
 180 185 190

Val Gly Gln Pro Ile Thr Asp Ile Tyr Gln Gln Glu Glu Tyr Ser Leu  
 195 200 205

Tyr Glu Ile Gly Tyr Ser Trp Asn Leu Asp Phe Thr Lys Glu Glu Phe  
 210 215 220

Arg Gly Arg Asp Ser Leu Leu Glu His Ile Arg Ser Ala Thr Val Lys  
 225 230 235 240

Ser Val Gly Phe Ser Thr Lys Glu Lys Leu Ala Ser Gly Thr Pro Val  
 245 250 255

Leu Phe Asp Asp Gln Ile Val Gly Lys Ile Phe Trp Ile Ala Asp Glu  
 260 265 270

Lys His Ser Ser Glu Asn Tyr Leu Gly Leu Met Ile Val Asn Gln Thr  
 275 280 285

Tyr Ala His Ser Gly Val Thr Phe Val Thr Glu Asp Gly Gln Ile Leu  
 290 295 300

Lys Thr Gln Ser Ser Pro Tyr Cys Ile Pro Glu Ser Trp Asn Lys Glu  
 305 310 315 320

<210> 81

<211> 702

<212> DNA

<213> Streptococcus agalactiae

<400> 81

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 aaaacaactt tatttaatat actttatggg gatcttgacg ctgacaacgg gaccatttgt 180  
 ttattgaagg ataatcacga gtatcctctt accgataagg atattggtat tgttttattcc 240

gaaaactacc ttccagaatt tttaacaggg tatgaatttg taaaatttta catggattta 300  
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 acagagcgtc atagaattat caaaggatat tctgatggaa tgaagagtaa gctctcatta 420  
 atttgccctga tgatttctaa gccaaaagta attttactag atgagccact gactgcagtt 480  
 gatgttgat caagtattgc aataaaacgc cttttgttg aattaagtga ggatcatatt 540  
 attatattat caactcatat aatggcctta gcagaagatc tatgtgatat tgtggctgta 600  
 ttagacaaaag gaaaactcca aacattagat attgatcgta aacatgaaca attcgaagag 660  
 cgtcttcttc aagtgttgaa gggagatgaa tatgacaagt aa 702

<210> 82

<211> 233

<212> PRT

<213> Streptococcus agalactiae

<400> 82

Met Glu Leu Val Ile Arg Asp Ile Arg Lys Arg Phe Gln Glu Thr Glu

1

5

10

15

Val Leu Arg Gly Ala Ser Tyr Arg Phe Tyr Ser Gly Lys Ile Thr Gly

20

25

30

Val Leu Gly Arg Asn Gly Ala Gly Lys Thr Thr Leu Phe Asn Ile Leu

35

40

45

Tyr Gly Asp Leu Ala Ala Asp Asn Gly Thr Ile Cys Leu Leu Lys Asp

50

55

60

Asn His Glu Tyr Pro Leu Thr Asp Lys Asp Ile Gly Ile Val Tyr Ser

65

70

75

80

Glu Asn Tyr Leu Pro Glu Phe Leu Thr Gly Tyr Glu Phe Val Lys Phe

85

90

95

Tyr Met Asp Leu His Pro Ser Asp Asp Leu Met Thr Ile Asp Asp Tyr

100

105

110

Leu Asp Phe Met Glu Ile Gly Gln Thr Glu Arg His Arg Ile Ile Lys  
 115 120 125

Gly Tyr Ser Asp Gly Met Lys Ser Lys Leu Ser Leu Ile Cys Leu Met  
 130 135 140

Ile Ser Lys Pro Lys Val Ile Leu Leu Asp Glu Pro Leu Thr Ala Val  
 145 150 155 160

Asp Val Val Ser Ser Ile Ala Ile Lys Arg Leu Leu Leu Glu Leu Ser  
 165 170 175

Glu Asp His Ile Ile Ile Leu Ser Thr His Ile Met Ala Leu Ala Glu  
 180 185 190

Asp Leu Cys Asp Ile Val Ala Val Leu Asp Lys Gly Lys Leu Gln Thr  
 195 200 205

Leu Asp Ile Asp Arg Lys His Glu Gln Phe Glu Glu Arg Leu Leu Gln  
 210 215 220

Val Leu Lys Gly Asp Glu Tyr Asp Lys  
 225 230

<210> 83

<211> 774

<212> DNA

<213> Streptococcus agalactiae

<400> 83

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 gtcttttttaa tacgtgacgg tcaaatggat ggtcaacgta ttcataatddd tgaagaacta 180  
 cctctttctg gaggatcact tgacgggtgc aaacgacctg atacgggttt tgtaacgcgt 240  
 ggtggctcgtg aaatggaaaa tcacttcgaa tgtatgtggg atatgtaccg ttccatcccc 300  
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<210> 84
<211> 258
<212> PRT
<213> Streptococcus agalactiae
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<400> 84
Met Phe Met Arg Tyr Thr Asn Gly Asn Phe Glu Ala Phe Ala Arg Pro
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Arg Lys Pro Glu Gly Val Asp Lys Lys Ser Ala Tyr Ile Val Gly Ser
          20                      25                      30

Gly Leu Ala Gly Leu Ala Ala Ala Val Phe Leu Ile Arg Asp Gly Gln
          35                      40                      45

Met Asp Gly Gln Arg Ile His Ile Phe Glu Glu Leu Pro Leu Ser Gly
          50                      55                      60

Gly Ser Leu Asp Gly Val Lys Arg Pro Asp Ile Gly Phe Val Thr Arg
  65                      70                      75                      80

Gly Gly Arg Glu Met Glu Asn His Phe Glu Cys Met Trp Asp Met Tyr
          85                      90                      95

Arg Ser Ile Pro Ser Leu Glu Val Pro Asp Ala Ser Tyr Leu Asp Glu
          100                      105                      110

Phe Tyr Trp Leu Asp Lys Asp Asp Pro Asn Ser Ser Asn Cys Arg Leu
          115                      120                      125

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Ile His Lys Gln Gly Asn Arg Leu Glu Ser Asp Gly Asp Phe Thr Leu  
 130 135 140

Gly Thr His Ser Lys Glu Leu Val Lys Leu Val Met Glu Thr Glu Glu  
 145 150 155 160

Ser Leu Gly Ala Lys Thr Ile Glu Glu Val Phe Ser Lys Glu Phe Phe  
 165 170 175

Glu Ser Asn Phe Trp Thr Tyr Trp Ala Thr Met Phe Ala Phe Glu Lys  
 180 185 190

Trp His Ser Ala Ile Glu Met Arg Arg Tyr Ala Met Arg Phe Ile His  
 195 200 205

His Ile Gly Gly Leu Pro Asp Phe Thr Ser Leu Lys Phe Asn Lys Tyr  
 210 215 220

Asn Gln Tyr Asp Ser Met Val Lys Pro Ile Ile Ser Tyr Leu Glu Ser  
 225 230 235 240

His Asn Val Asp Val Gln Phe Asp Ser Lys Val Thr Asn Ile Ser Val  
 245 250 255

Asp Phe

<210> 85

<211> 903

<212> DNA

<213> Streptococcus agalactiae

<400> 85

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tctcgaatga ctctactat ttttaatttca ggatccagtg ctactcaaga acgattttaac 240  
 agcatgttag cacagctcaa ccaaattggga gaaaaacata gcgtttttaa gttaactgtc 300  
 aaaaaagaca atagcattat ctacaatgga caaattagcg gcaatgacca caaacctac 360  
 attgtcattg gatttgaata taatgaagat gggttatagta acatcaaaaa acaaacaaaa 420  
 tggctacaga ttgctatgaa tgatcttcag aagaaatata aattttaaacy ttttaacgct 480  
 atcggtcatt caaatgggtg cttatcatgg actattttcc tagaagatta ttacgactct 540  
 gatgaatttg atatgaaatc attgttaaca atgggaacac cttttaactt tgaagaaagt 600  
 aacacctcaa atcatactca aatgcttaaa gattttaatca gtaataaagg aaatattcca 660  
 tcaagtctca tgggtatacaa tttggcagga actaattcat atgatgggtga taaaattggt 720  
 ccatttgcta gtgtggagac tggtaaataat attttccaag aaaccgctaa acactatacc 780  
 caactaacag taactggtaa taatgctaca cattctgact tgctgataa tcctgaagtt 840  
 atccaatatg tcgcagaaaa aattcttaaa aatgagaaag gtaaattacc aaaacctcac 900  
 taa 903

<210> 86

<211> 300

<212> PRT

<213> Streptococcus agalactiae

<400> 86

Met Leu Ala Ser Leu Phe Ile Val Arg Leu Ser Lys Ser Leu Ser Leu

1

5

10

15

Arg Arg Ser Asn Met Lys Lys Leu Leu Arg Trp Leu Pro Pro Val Leu

20

25

30

Phe Ile Ile Ile Leu Ile Gly Met Thr Ile Leu Gly Lys Ser Tyr Ile

35

40

45

Asn Lys Val Thr Ala His Lys Ile Lys Leu Tyr Asn Ser Arg Met Thr

50

55

60

Pro Thr Ile Leu Ile Ser Gly Ser Ser Ala Thr Gln Glu Arg Phe Asn

65

70

75

80

Ser Met Leu Ala Gln Leu Asn Gln Met Gly Glu Lys His Ser Val Leu

85

90

95

Lys Leu Thr Val Lys Lys Asp Asn Ser Ile Ile Tyr Asn Gly Gln Ile  
 100 105 110

Ser Gly Asn Asp His Lys Pro Tyr Ile Val Ile Gly Phe Glu Asn Asn  
 115 120 125

Glu Asp Gly Tyr Ser Asn Ile Lys Lys Gln Thr Lys Trp Leu Gln Ile  
 130 135 140

Ala Met Asn Asp Leu Gln Lys Lys Tyr Lys Phe Lys Arg Phe Asn Ala  
 145 150 155 160

Ile Gly His Ser Asn Gly Gly Leu Ser Trp Thr Ile Phe Leu Glu Asp  
 165 170 175

Tyr Tyr Asp Ser Asp Glu Phe Asp Met Lys Ser Leu Leu Thr Met Gly  
 180 185 190

Thr Pro Phe Asn Phe Glu Glu Ser Asn Thr Ser Asn His Thr Gln Met  
 195 200 205

Leu Lys Asp Leu Ile Ser Asn Lys Gly Asn Ile Pro Ser Ser Leu Met  
 210 215 220

Val Tyr Asn Leu Ala Gly Thr Asn Ser Tyr Asp Gly Asp Lys Ile Val  
 225 230 235 240

Pro Phe Ala Ser Val Glu Thr Gly Lys Tyr Ile Phe Gln Glu Thr Ala  
 245 250 255

Lys His Tyr Thr Gln Leu Thr Val Thr Gly Asn Asn Ala Thr His Ser  
 260 265 270

Asp Leu Pro Asp Asn Pro Glu Val Ile Gln Tyr Val Ala Glu Lys Ile  
 275 280 285

Leu Lys Asn Glu Lys Gly Lys Leu Pro Lys Pro His  
 290 295 300

100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300

<210> 87

<211> 912

<212> DNA

<213> Streptococcus agalactiae

<400> 87

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ggtttagatg tatatggtat tggagagcac catcgtgaag attttgcggt ctctgcaccc 180
gaaattatcc tagcagcagg agcggttaga actaataata tccgtttatc tagtgacgta 240
acgattctct cttccaatga tcctattcgc gtctatcagc aattttcaac gattgacgca 300
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tccgtaatgg acacaaacca ggaacaacta aaagttgctg ctcaactcttg gggatggatt 720
gaagaggata atcaaaccgc tattgaccgt tattttttcc ctacgaaaca gaccgtcgat 780
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ggactttggt ga 912

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<210> 88

<211> 303

<212> PRT

<213> Streptococcus agalactiae

<400> 88

Met Lys Leu Gly Ile Thr Thr Phe Gly Glu Thr Thr Ile Leu Glu Glu

1

5

10

15

Thr Asn Gln Ser Tyr Ser His Pro Glu Arg Ile Arg Gln Leu Val Ala

20

25

30

Glu Ile Glu Leu Ala Asp Gln Val Gly Leu Asp Val Tyr Gly Ile Gly  
 35 40 45

Glu His His Arg Glu Asp Phe Ala Val Ser Ala Pro Glu Ile Ile Leu  
 50 55 60

Ala Ala Gly Ala Val Arg Thr Asn Asn Ile Arg Leu Ser Ser Ala Val  
 65 70 75 80

Thr Ile Leu Ser Ser Asn Asp Pro Ile Arg Val Tyr Gln Gln Phe Ser  
 85 90 95

Thr Ile Asp Ala Leu Ser Asn Gly Arg Ala Glu Ile Met Ala Gly Arg  
 100 105 110

Gly Ser Phe Ile Glu Ser Phe Pro Leu Phe Gly Tyr Asp Leu Ala Asp  
 115 120 125

Tyr Asp Asp Leu Phe Asn Glu Lys Met Asp Met Leu Leu Ala Ile Asn  
 130 135 140

Ser Ala Thr Asn Leu Asp Trp Lys Gly His Leu Thr Gln Thr Val Asn  
 145 150 155 160

Glu Arg Pro Ile Tyr Pro Arg Ala Leu Gln Arg Gln Leu Ser Ile Trp  
 165 170 175

Val Ala Thr Gly Gly Asn Val Asp Ser Thr Ile Arg Ile Ala Glu Gln  
 180 185 190

Gly Leu Pro Ile Val Tyr Ala Thr Ile Gly Gly Asn Pro Lys Ala Phe  
 195 200 205

Arg Gln Leu Val His Ile Tyr Lys Glu Val Gly Lys Ser Val Met Asp  
 210 215 220

Thr Asn Gln Glu Gln Leu Lys Val Ala Ala His Ser Trp Gly Trp Ile  
 225 230 235 240

100

Glu Glu Asp Asn Gln Thr Ala Ile Asp Arg Tyr Phe Phe Pro Thr Lys  
245 250 255

Gln Thr Val Asp Asn Ile Ala Lys Gly Arg Pro His Trp Ser Glu Met  
260 265 270

Thr Lys Glu Gln Tyr Leu Arg Ser Ile Gly Pro Glu Gly Ala Ile Phe  
275 280 285

Val Gly Asn Pro Glu Val Val Ala His Lys Ile Ile Gly Leu Trp  
290 295 300

<210> 89

<211> 693

<212> DNA

<213> Streptococcus agalactiae

<400> 89

atgatagagt ggattcaaac acatttacca aatgtatatc aaatgggttg ggaaggtgct 60  
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ggaggtttta tgggattggt aggaggttta ttcccttggt taactagtcc tagaggagtt 180  
attgctaata aattagtatt tggaggttta gataaagttg tttctgtttt tagagctctg 240  
cccttcatta ttcttcttgc tttgattgcg ccagtaactc gcgtaattgt aggaacaaca 300  
cttggttcac cagcagcttt ggtacctctt tctttggcag ttttccatt ttttgctcgt 360  
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ggtggaacac tttgggatat tattgtagtt tatcttcgtg aaggtctacc agatttaatt 480  
cgagtatcaa cggttacttt gatttcttta gtaggtgaaa cagctatggc tggcgctatt 540  
ggtgcaggag gattgggttc tggtgctatt actaaaggat ataactatc tcgtgatgat 600  
attactttag tagcgactat tctgatttta ttattaattt tctttatcca atttttaggt 660  
gattttttta cacgtcgctt gagtcataaa taa 693

<210> 90

<211> 230

<212> PRT

<213> Streptococcus agalactiae

101

<400> 90

Met Ile Glu Trp Ile Gln Thr His Leu Pro Asn Val Tyr Gln Met Gly  
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Trp Glu Gly Ala Tyr Gly Trp Gln Thr Ala Ile Val Gln Thr Leu Tyr  
20 25 30

Met Thr Phe Trp Ser Phe Leu Ile Gly Gly Leu Met Gly Leu Leu Gly  
35 40 45

Gly Leu Phe Leu Val Leu Thr Ser Pro Arg Gly Val Ile Ala Asn Lys  
50 55 60

Leu Val Phe Gly Val Leu Asp Lys Val Val Ser Val Phe Arg Ala Leu  
65 70 75 80

Pro Phe Ile Ile Leu Leu Ala Leu Ile Ala Pro Val Thr Arg Val Ile  
85 90 95

Val Gly Thr Thr Leu Gly Ser Pro Ala Ala Leu Val Pro Leu Ser Leu  
100 105 110

Ala Val Phe Pro Phe Phe Ala Arg Gln Val Gln Val Val Leu Ala Glu  
115 120 125

Leu Asp Gly Gly Val Ile Glu Ala Ala Gln Ala Ser Gly Gly Thr Leu  
130 135 140

Trp Asp Ile Ile Val Val Tyr Leu Arg Glu Gly Leu Pro Asp Leu Ile  
145 150 155 160

Arg Val Ser Thr Val Thr Leu Ile Ser Leu Val Gly Glu Thr Ala Met  
165 170 175

Ala Gly Ala Ile Gly Ala Gly Gly Leu Gly Ser Val Ala Ile Thr Lys  
180 185 190

Arg Arg Leu Ser His Lys  
225 230

<400> 91						
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gtctatgggt	cttggaattt	tcctgttttt	attaagttaa	cacaaagtgt	accaactttg	180
accacaaact	cactcctcgc	agcacttttt	ggaggtgtta	ttgtaggatg	tgggttgggg	240
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catggacgtc	ttgatgaaga	cattcttatg	ccaatgtaa			759

<213> Streptococcus agalactiae

Met Ala Val Ser Phe His Glu Val Phe Gly Trp Asp Ser Ala Phe Phe  
1 5 10 15

Ile Met Ile Ile Asn Ile Pro Leu Leu Leu Leu Cys Tyr Phe Gly Leu  
20 25 30

Gly Lys Gln Thr Phe Leu Lys Thr Val Tyr Gly Ser Trp Ile Phe Pro  
35 40 45

Val Phe Ile Lys Leu Thr Gln Ser Val Pro Thr Leu Thr His Asn Ser  
50 55 60

Leu Leu Ala Ala Leu Phe Gly Gly Val Ile Val Gly Cys Gly Leu Gly  
65 70 75 80

Ile Val Phe Trp Ser Asp Ser Ser Thr Gly Gly Thr Gly Ile Ile Ile  
85 90 95

Gln Phe Leu Gly Lys Tyr Thr Pro Ile Ser Leu Gly Gln Gly Val Ile  
100 105 110

Leu Ile Asp Gly Leu Val Thr Ile Val Gly Phe Leu Ala Phe Asp Ser  
115 120 125

Asp Thr Val Met Phe Ser Ile Ile Gly Leu Ile Thr Ile Ser Tyr Ile  
130 135 140

Ile Asn Ala Ile Gln Thr Gly Phe Thr Thr Leu Ser Thr Val Leu Ile  
145                    150                    155                    160

Val Ser Gln Glu His Gln Lys Ile Lys Thr Tyr Ile Asn Thr Val Ala  
165 170 175

Asp Arg Gly Val Thr Glu Ile Pro Val Lys Gly Gly Tyr Ser Gly Thr  
 180 185 190

Asn Gln Ile Met Leu Met Thr Thr Ile Ala Gly Tyr Glu Phe Ala Lys  
 195 200 205

Leu Gln Glu Ala Ile Ala Glu Ile Asp Glu Thr Ala Phe Ile Thr Val  
 210 215 220

Thr Pro Thr Ser Gln Ala Ser Gly Arg Gly Phe Ser Leu Gln Lys Asn  
 225 230 235 240

His Gly Arg Leu Asp Glu Asp Ile Leu Met Pro Met  
 245 250

<210> 93

<211> 549

<212> DNA

<213> Streptococcus agalactiae

<400> 93

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 gttattctaa gtccaaatag tcaagccatt ttaacaggaa cgattccago ttttgaggaa 180  
 aaatacggta taaaagttaa gcttattcaa ggtgggacag ggcaactaat agatagatta 240  
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&lt;210&gt; 94

&lt;211&gt; 182

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 94

Met Lys Glu Lys Gln Ser Lys Arg Leu Ile Tyr Ile Leu Leu Ile Val

1

5

10

15

Pro Ile Ile Phe Ile Ser Val Phe Thr Tyr Ser Ile Ser Gln Pro Ser

20

25

30

Lys Leu Leu Pro Pro Lys Glu Leu Val Ile Leu Ser Pro Asn Ser Gln

35

40

45

Ala Ile Leu Thr Gly Thr Ile Pro Ala Phe Glu Glu Lys Tyr Gly Ile

50

55

60

Lys Val Lys Leu Ile Gln Gly Gly Thr Gly Gln Leu Ile Asp Arg Leu

65

70

75

80

Ser Lys Glu Gly Lys Gln Leu Lys Ala Asp Ile Phe Phe Gly Gly Asn

85

90

95

Tyr Thr Gln Phe Glu Ser His Lys Ala Leu Phe Glu Ser Tyr Val Ser

100

105

110

Lys Asn Val His Thr Val Ile Pro Asp Tyr Ile His Pro Ser Asp Thr

115

120

125

Ala Thr Pro Tyr Thr Ile Asn Gly Ser Val Leu Ile Val Asn Asn Glu

130

135

140

Leu Ala Lys Gly Leu Thr Ile Lys Ser Tyr Glu Asp Leu Leu Gln Pro

145

150

155

160

Ser Leu Lys Gly Lys Ile Ala Phe Ala Asp Pro Leu Glu Ser Thr Cys

165

170

175

Lys His Ala Ser Leu Ala

180

<210> 95

<211> 368

<212> DNA

<213> Streptococcus agalactiae

<400> 95

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tacatatcca gccgccaaaa caaaccacca cgcttttgaa tcaggattgg catatcacac 180
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tttgatgttt gctggtatta tgctacatga tttagccaag gtcataagagt tatcgggtcc 300
tgataatata gaatatata ttcgaggtaa tcttatcggt catatttcac ttattgatga 360
ggaattaa                                     368
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<210> 96

<211> 122

<212> PRT

<213> Streptococcus agalactiae

<400> 96

Leu Leu Ser Asn Asp Asp Lys Arg Glu Arg Tyr Met Glu Gln Met Leu

1

5

10

15

Phe Lys Ile Glu Asn Ala Thr Trp Gln Arg Val Val Arg Ala Leu Tyr

20

25

30

Arg Lys Tyr Asn Lys Glu Phe Phe Thr Tyr Pro Ala Ala Lys Thr Asn

35

40

45

His His Ala Phe Glu Ser Gly Leu Ala Tyr His Thr Ala Thr Met Val

50

55

60

107

Arg Leu Ala Asp Ser Ile Gly Asp Ile Tyr Pro Glu Leu Asn Lys Ser  
65 70 75 80

Leu Met Phe Ala Gly Ile Met Leu His Asp Leu Ala Lys Val Ile Glu  
85 90 95

Leu Ser Gly Pro Asp Asn Thr Glu Tyr Thr Ile Arg Gly Asn Leu Ile  
100 105 110

Gly His Ile Ser Leu Ile Asp Glu Glu Leu  
115 120

<210> 97

<211> 753

<212> DNA

<213> Streptococcus agalactiae

<400> 97

atgaaaaaaa ataaaattat ccgattcagt ttagttggtg ttctacttgc gatactatgc 60  
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aatgaggata taaaaaagac atcctctcaa aaaagaaata agaaattacg attaccagct 180  
gtatcatcaa aagattggaa cttgatTTTtg gtcaatcgtg accataaaca tgaagaatta 240  
agtccagatg tggTgcctgt tgaaaaatatt tatttgata aacgtattac gaagcaagct 300  
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aaccctaatt tgacgagggg acaagcagaa aagttggtaa aaacttactc tcagcctgca 480  
ggtgctagtG aacaccagac tggattagcg atggatatga gtactgtaga ttctttgaat 540  
gagagcgatc ctagagtagt cagtcagttg aaaaagatag ctccacaata tggTTTTgtc 600  
ttacggTTTT cggatggtaa aacagcagaa acaggggtag gttatgaaga ttggcattac 660  
cgctatgttg gggtagagtc tgcaaaatat atggTcaaac atcatttaac attagaagaa 720  
tacataactt tattaagga gaataaccaa tga 753

&lt;210&gt; 98

&lt;211&gt; 250

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 98

Met Lys Lys Asn Lys Ile Ile Arg Phe Ser Leu Val Gly Val Leu Leu  
 1 5 10 15

Ala Ile Leu Cys Phe Ser Leu Phe Ala Leu Leu Lys Pro Asn Ser Gln  
 20 25 30

Gln Ser Ser Ser Gln Lys Leu Arg Asn Glu Asp Ile Lys Lys Thr Ser  
 35 40 45

Ser Gln Lys Arg Asn Lys Lys Leu Arg Leu Pro Ala Val Ser Ser Lys  
 50 55 60

Asp Trp Asn Leu Ile Leu Val Asn Arg Asp His Lys His Glu Glu Leu  
 65 70 75 80

Ser Pro Asp Val Val Pro Val Glu Asn Ile Tyr Leu Asp Lys Arg Ile  
 85 90 95

Thr Lys Gln Ala Thr Gln Phe Leu Glu Ala Ala Arg Ala Ile Asp Ser  
 100 105 110

Arg Glu His Leu Ile Ser Gly Tyr Arg Ser Val Ala Tyr Gln Glu Lys  
 115 120 125

Leu Phe Asn Ser Tyr Val Thr Gln Glu Met Thr Ser Asn Pro Asn Leu  
 130 135 140

Thr Arg Gly Gln Ala Glu Lys Leu Val Lys Thr Tyr Ser Gln Pro Ala  
 145 150 155 160

Gly Ala Ser Glu His Gln Thr Gly Leu Ala Met Asp Met Ser Thr Val  
 165 170 175

109

Asp Ser Leu Asn Glu Ser Asp Pro Arg Val Val Ser Gln Leu Lys Lys  
180 185 190

Ile Ala Pro Gln Tyr Gly Phe Val Leu Arg Phe Pro Asp Gly Lys Thr  
195 200 205

Ala Glu Thr Gly Val Gly Tyr Glu Asp Trp His Tyr Arg Tyr Val Gly  
210 215 220

Val Glu Ser Ala Lys Tyr Met Val Lys His His Leu Thr Leu Glu Glu  
225 230 235 240

Tyr Ile Thr Leu Leu Lys Glu Asn Asn Gln  
245 250

<210> 99

<211> 351

<212> DNA

<213> Streptococcus agalactiae

<400> 99

ctgttatgtg gatttcttcc atcaattcct gtgtctaatt ccggggggta tggataata 60  
acagttatga aaaataaaaa aatcttattt gggactggcc ttgctgggtgt gggtttactg 120  
gcagctgctg gttataccct aactaaaaaa gtaacagatt ataaacgtca gcaaatacact 180  
cagacottaa gagaactttt tagtcagatg ggtgatattc aggtatttta ttttaatgaa 240  
tttgaatctg atattaaaaat gaccagtggg ggtcttgtct tggaagatgg cagaattttc 300  
gaattcattt atcgtcaagg tgttcttgat tatgtggagg tgagcaaata a 351

<210> 100

<211> 116

<212> PRT

<213> Streptococcus agalactiae

<400> 100

Leu Leu Cys Gly Phe Leu Pro Ser Ile Pro Val Ser Asn Ser Gly Gly  
1 5 10 15

110

Tyr Gly Ile Ile Thr Val Met Lys Asn Lys Lys Ile Leu Phe Gly Thr  
20 25 30

Gly Leu Ala Gly Val Gly Leu Leu Ala Ala Ala Gly Tyr Thr Leu Thr  
35 40 45

Lys Lys Val Thr Asp Tyr Lys Arg Gln Gln Ile Thr Gln Thr Leu Arg  
50 55 60

Glu Leu Phe Ser Gln Met Gly Asp Ile Gln Val Phe Tyr Phe Asn Glu  
65 70 75 80

Phe Glu Ser Asp Ile Lys Met Thr Ser Gly Gly Leu Val Leu Glu Asp  
85 90 95

Gly Arg Ile Phe Glu Phe Ile Tyr Arg Gln Gly Val Leu Asp Tyr Val  
100 105 110

Glu Val Ser Lys  
115

<210> 101

<211> 310

<212> DNA

<213> Streptococcus agalactiae

<400> 101

atgtatcaaa ctcagacaaa taaggaaaaa tttgttttat ttttgaaatt atttatccca 60  
gtattgattt atcaatttgc taatttttca gctactttta ttgattcggg tatgactgga 120  
cagtatagtc agctacattt ggcagggtgtg tcaactgcta gtaatttatg gactccgttt 180  
ttcgctttat tagtaggtat gatttcagca ttagtaccag tagttggtca acatttgggt 240  
agaggaaata aagaacaaat tcgcacagaa tttcatcaat ttctatattt aggtttgata 300  
ctgtccttaa 310

<211> 103

<213> Streptococcus agalactiae

Met Tyr Gln Thr Gln Thr Asn Lys Glu Lys Phe Val Leu Phe Leu Lys  
1 5 10 15

Leu Phe Ile Pro Val Leu Ile Tyr Gln Phe Ala Asn Phe Ser Ala Thr  
20 25 30

Phe Ile Asp Ser Val Met Thr Gly Gln Tyr Ser Gln Leu His Leu Ala  
35 40 45

Gly Val Ser Thr Ala Ser Asn Leu Trp Thr Pro Phe Phe Ala Leu Leu  
50 55 60

Val Gly Met Ile Ser Ala Leu Val Pro Val Val Gly Gln His Leu Gly  
65 70 75 80

Arg Gly Asn Lys Glu Gln Ile Arg Thr Glu Phe His Gln Phe Leu Tyr  
85 90 95

Leu Gly Leu Ile Leu Ser Leu  
100

<211> 1098

<213> Streptococcus agalactiae

ctgctctttt tagctaactt ttctaattta tgggtataatt gtatggattg ttttagctaga 60  
atggagaaga tgatgcaaga tgttttcatt ataggaagta gaggggtgcc agctcgttac 120  
ggtggttttg aaacttttgt ttcagaattg attaatcatc aaaaaagtgc cgacataaaa 180

taccatgttg catgccttag tgataaagaa catcatactc attttaactt tgctgacgct 240  
 gattgtttta ctataaatcc tccccaatta gggccagcac gtgtgattgc ttatgatatt 300  
 atggccatta attatgccct tgacttggtt aagacacatg atttaaaaga gcctattttt 360  
 tatatttttag gaaatacaat tgggtgccttt atttggcatt ttgccaataa aatacataaa 420  
 gtcggtggct tattgtatgt taatccggat ggtttagagt ggaagcgatc aaagtgggtct 480  
 cgtcccacac agcgttattt aaaatacgcc gaaaaatgta tgactaaaaa tgcagaccta 540  
 attatttctg ataattattg tattgaaaat tacattcaat ctacctactc taatgtgaag 600  
 acaaggttca ttgcttacgg tacagagatt aattctagga aattatcgtc agatgatcca 660  
 cgtgtcaaac agttgtttta aaaatggaat attaagtcta agggttacta tctaatacgtt 720  
 ggtcgatttg tccctgaaaa caattatgaa acggctatta gggagttcat ggcttcagat 780  
 actaagcgtg atttagttat tatctgtaac catcaaaata acccctactt tgaaaagttg 840  
 tccttaaaga caaaccttca acaagataaa agagttaagt ttgtaggtag gctctatgaa 900  
 aaagatctgc tggattatgt tcgtcaacaa gcctttgctt atattcatgg gcatgaagtt 960  
 ggcggtacta atccaggact gcttgaggct ttagctaata ctgatttgaa tcttgttcta 1020  
 gatgttgatt tcaacaaatc agtagcaggt ctctcaagtt ttactggac taaaaaagag 1080  
 ggggatttag ctaagctt 1098

<210> 104

<211> 366

<212> PRT

<213> Streptococcus agalactiae

<400> 104

Met Leu Phe Leu Ala Asn Phe Ser Asn Leu Trp Tyr Asn Cys Met Asp

1

5

10

15

Cys Leu Ala Arg Met Glu Lys Met Met Gln Asp Val Phe Ile Ile Gly

20

25

30

Ser Arg Gly Leu Pro Ala Arg Tyr Gly Gly Phe Glu Thr Phe Val Ser

35

40

45

Glu Leu Ile Asn His Gln Lys Ser Ser Asp Ile Lys Tyr His Val Ala

50

55

60

Cys Leu Ser Asp Lys Glu His His Thr His Phe Asn Phe Ala Asp Ala

65

70

75

80

113

Asp Cys Phe Thr Ile Asn Pro Pro Gln Leu Gly Pro Ala Arg Val Ile  
85 90 95

Ala Tyr Asp Ile Met Ala Ile Asn Tyr Ala Leu Asp Leu Val Lys Thr  
100 105 110

His Asp Leu Lys Glu Pro Ile Phe Tyr Ile Leu Gly Asn Thr Ile Gly  
115 120 125

Ala Phe Ile Trp His Phe Ala Asn Lys Ile His Lys Val Gly Gly Leu  
130 135 140

Leu Tyr Val Asn Pro Asp Gly Leu Glu Trp Lys Arg Ser Lys Trp Ser  
145 150 155 160

Arg Pro Thr Gln Arg Tyr Leu Lys Tyr Ala Glu Lys Cys Met Thr Lys  
165 170 175

Asn Ala Asp Leu Ile Ile Ser Asp Asn Ile Gly Ile Glu Asn Tyr Ile  
180 185 190

Gln Ser Thr Tyr Ser Asn Val Lys Thr Arg Phe Ile Ala Tyr Gly Thr  
195 200 205

Glu Ile Asn Ser Arg Lys Leu Ser Ser Asp Asp Pro Arg Val Lys Gln  
210 215 220

Leu Phe Lys Lys Trp Asn Ile Lys Ser Lys Gly Tyr Tyr Leu Ile Val  
225 230 235 240

Gly Arg Phe Val Pro Glu Asn Asn Tyr Glu Thr Ala Ile Arg Glu Phe  
245 250 255

Met Ala Ser Asp Thr Lys Arg Asp Leu Val Ile Ile Cys Asn His Gln  
260 265 270

Asn Asn Pro Tyr Phe Glu Lys Leu Ser Leu Lys Thr Asn Leu Gln Gln  
275 280 285

Asp Lys Arg Val Lys Phe Val Gly Thr Leu Tyr Glu Lys Asp Leu Leu  
 290 295 300

Asp Tyr Val Arg Gln Gln Ala Phe Ala Tyr Ile His Gly His Glu Val  
 305 310 315 320

Gly Gly Thr Asn Pro Gly Leu Leu Glu Ala Leu Ala Asn Thr Asp Leu  
 325 330 335

Asn Leu Val Leu Asp Val Asp Phe Asn Lys Ser Val Ala Gly Leu Ser  
 340 345 350

Ser Phe Tyr Trp Thr Lys Lys Glu Gly Asp Leu Ala Lys Leu  
 355 360 365

<210> 105

<211> 546

<212> DNA

<213> Streptococcus agalactiae

<400> 105

ttgaggagta atatggtaaa gacagcagtt ttaatggcga catacaatgg cgaaaaattt 60  
 atatctgaac aacttgattc aattcgcaa cagacattaa aaccagatta tgtattattg 120  
 agggatgatt gttcaacgga tgaaacagtc aatgtcgtca ataactatat cgcaaaacat 180  
 gagttagaag gctggaaaat tgttaaaaac gacaaaaact taggctggcg tttaaatttt 240  
 cgtcaattac ttattgatgt gttagcctat gaggttgact atgtcttttt tagtgatcaa 300  
 gatgatattt ggtatcttga taaaaacgaa cgacagtttg ccattatgtc agataaccct 360  
 caaattgagg ttttgagtgc agacgttgat atcaaaacga tgtctacaga agccagtgtt 420  
 ccacattttc taactttttc ttctagtgat agaatcagtc agtatcctaa agtatatgat 480  
 tatcaaacat tccgtcccgg atggaccatt gctatgaaga gagattttgc gcaagctatc 540  
 gcttga 546

&lt;210&gt; 106

&lt;211&gt; 181

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 106

Met Arg Ser Asn Met Val Lys Thr Ala Val Leu Met Ala Thr Tyr Asn

1

5

10

15

Gly Glu Lys Phe Ile Ser Glu Gln Leu Asp Ser Ile Arg Gln Gln Thr

20

25

30

Leu Lys Pro Asp Tyr Val Leu Leu Arg Asp Asp Cys Ser Thr Asp Glu

35

40

45

Thr Val Asn Val Val Asn Asn Tyr Ile Ala Lys His Glu Leu Glu Gly

50

55

60

Trp Lys Ile Val Lys Asn Asp Lys Asn Leu Gly Trp Arg Leu Asn Phe

65

70

75

80

Arg Gln Leu Leu Ile Asp Val Leu Ala Tyr Glu Val Asp Tyr Val Phe

85

90

95

Phe Ser Asp Gln Asp Asp Ile Trp Tyr Leu Asp Lys Asn Glu Arg Gln

100

105

110

Phe Ala Ile Met Ser Asp Asn Pro Gln Ile Glu Val Leu Ser Ala Asp

115

120

125

Val Asp Ile Lys Thr Met Ser Thr Glu Ala Ser Val Pro His Phe Leu

130

135

140

Thr Phe Ser Ser Ser Asp Arg Ile Ser Gln Tyr Pro Lys Val Tyr Asp

145

150

155

160

Tyr Gln Thr Phe Arg Pro Gly Trp Thr Ile Ala Met Lys Arg Asp Phe

165

170

175

115  
 106  
 181  
 PRT  
 Streptococcus agalactiae  
 106  
 Met Arg Ser Asn Met Val Lys Thr Ala Val Leu Met Ala Thr Tyr Asn  
 1 5 10 15  
 Gly Glu Lys Phe Ile Ser Glu Gln Leu Asp Ser Ile Arg Gln Gln Thr  
 20 25 30  
 Leu Lys Pro Asp Tyr Val Leu Leu Arg Asp Asp Cys Ser Thr Asp Glu  
 35 40 45  
 Thr Val Asn Val Val Asn Asn Tyr Ile Ala Lys His Glu Leu Glu Gly  
 50 55 60  
 Trp Lys Ile Val Lys Asn Asp Lys Asn Leu Gly Trp Arg Leu Asn Phe  
 65 70 75 80  
 Arg Gln Leu Leu Ile Asp Val Leu Ala Tyr Glu Val Asp Tyr Val Phe  
 85 90 95  
 Phe Ser Asp Gln Asp Asp Ile Trp Tyr Leu Asp Lys Asn Glu Arg Gln  
 100 105 110  
 Phe Ala Ile Met Ser Asp Asn Pro Gln Ile Glu Val Leu Ser Ala Asp  
 115 120 125  
 Val Asp Ile Lys Thr Met Ser Thr Glu Ala Ser Val Pro His Phe Leu  
 130 135 140  
 Thr Phe Ser Ser Ser Asp Arg Ile Ser Gln Tyr Pro Lys Val Tyr Asp  
 145 150 155 160  
 Tyr Gln Thr Phe Arg Pro Gly Trp Thr Ile Ala Met Lys Arg Asp Phe  
 165 170 175

Ala Gln Ala Ile Ala

180

&lt;210&gt; 107

&lt;211&gt; 639

&lt;212&gt; DNA

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 107

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gtgattatgg ataagtctat tcctaaagca actgctaaac gtttatcact gtactaccgt 60
atTTTTaaac gTTTTaatac tgatggcatc gaaaaagcta gttccaaaca aattgcagat 120
gocctaggta tcgattctgc tactgttcga cgtgattttt cttatttttg tgaactagga 180
cgccgtgggt ttggttatga tgtcaaaaaa cttatgaact tctttgcaga aatattgaac 240
gatcattota caacaaatgt tatgctgggt ggggtgtggaa atatcggtag agctctcttg 300
cattatcggt tccacgatcg caataaaatg caaatttcaa tggcttttga tttagatagc 360
aatgatttag ttggtaaaac aaccgaggat ggaattcctg tctacggtat ttcgactatc 420
aatgaccatt taatagatag tgatattgaa actgctatcc taacagtacc tagtacagaa 480
gcccaagaag ttgctgacat cttagtcaaa gcaggtataa aaggcatctt gagtttttct 540
ccagttcatt taacattacc aaaagatatc attgttcagt atgtagattt aacaagcgaa 600
ttacaaactt tactttatct catgaaccag cagcgataa 639

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&lt;210&gt; 108

&lt;211&gt; 212

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 108

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Met Ile Met Asp Lys Ser Ile Pro Lys Ala Thr Ala Lys Arg Leu Ser
  1             5             10             15

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Leu Tyr Tyr Arg Ile Phe Lys Arg Phe Asn Thr Asp Gly Ile Glu Lys
      20             25             30

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```

Ala Ser Ser Lys Gln Ile Ala Asp Ala Leu Gly Ile Asp Ser Ala Thr
    35             40             45

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117

Val Arg Arg Asp Phe Ser Tyr Phe Gly Glu Leu Gly Arg Arg Gly Phe  
50 55 60

Gly Tyr Asp Val Lys Lys Leu Met Asn Phe Phe Ala Glu Ile Leu Asn  
65 70 75 80

Asp His Ser Thr Thr Asn Val Met Leu Val Gly Cys Gly Asn Ile Gly  
85 90 95

Arg Ala Leu Leu His Tyr Arg Phe His Asp Arg Asn Lys Met Gln Ile  
100 105 110

Ser Met Ala Phe Asp Leu Asp Ser Asn Asp Leu Val Gly Lys Thr Thr  
115 120 125

Glu Asp Gly Ile Pro Val Tyr Gly Ile Ser Thr Ile Asn Asp His Leu  
130 135 140

Ile Asp Ser Asp Ile Glu Thr Ala Ile Leu Thr Val Pro Ser Thr Glu  
145 150 155 160

Ala Gln Glu Val Ala Asp Ile Leu Val Lys Ala Gly Ile Lys Gly Ile  
165 170 175

Leu Ser Phe Ser Pro Val His Leu Thr Leu Pro Lys Asp Ile Ile Val  
180 185 190

Gln Tyr Val Asp Leu Thr Ser Glu Leu Gln Thr Leu Leu Tyr Phe Met  
195 200 205

Asn Gln Gln Arg  
210

&lt;210&gt; 109

&lt;211&gt; 476

&lt;212&gt; DNA

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 109

atgggtgcta aaggagcaga tgcattctc gttttatcac actctggcat tggagatgat 60  
 cgatatgaag aaggtgaaga aaacgttggc tatcaaattg ccagcatcaa gggagtggat 120  
 gccgttggtta cgggacactc acacgctgaa tttccatcag gtaacggtac tggcttctat 180  
 gaaaaataca ctggagttga tggatatcaat ggaaaaataa atggaacacc tgttacaatg 240  
 gcaggcaagt acggggatca ccttgggtatt attgatttag gacttagtta tactaatgga 300  
 aaatggcaag tctccgaaag cagtgtctaaa atccgtaaaa ttgatatgaa ctcaacaact 360  
 gctgacgagc gtatcattgc attggctaag gaagcacacg atggcactat caactatggt 420  
 cgccaacaag taggtacaac aactgcgcca attacaagtt actttgcact agttaa 476

&lt;210&gt; 110

&lt;211&gt; 158

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 110

Met Gly Ala Lys Gly Ala Asp Val Ile Leu Val Leu Ser His Ser Gly  
 1 5 10 15

Ile Gly Asp Asp Arg Tyr Glu Glu Gly Glu Glu Asn Val Gly Tyr Gln  
 20 25 30

Ile Ala Ser Ile Lys Gly Val Asp Ala Val Val Thr Gly His Ser His  
 35 40 45

Ala Glu Phe Pro Ser Gly Asn Gly Thr Gly Phe Tyr Glu Lys Tyr Thr  
 50 55 60

Gly Val Asp Gly Ile Asn Gly Lys Ile Asn Gly Thr Pro Val Thr Met  
 65 70 75 80

119

Ala Gly Lys Tyr Gly Asp His Leu Gly Ile Ile Asp Leu Gly Leu Ser  
85 90 95

Tyr Thr Asn Gly Lys Trp Gln Val Ser Glu Ser Ser Ala Lys Ile Arg  
100 105 110

Lys Ile Asp Met Asn Ser Thr Thr Ala Asp Glu Arg Ile Ile Ala Leu  
115 120 125

Ala Lys Glu Ala His Asp Gly Thr Ile Asn Tyr Val Arg Gln Gln Val  
130 135 140

Gly Thr Thr Thr Ala Pro Ile Thr Ser Tyr Phe Ala Leu Val  
145 150 155

<210> 111

<211> 170

<212> DNA

<213> Streptococcus agalactiae

<400> 111

ttgtcaataa gggtttcaaat cagcttgaaa tatgataaaa taaaacagat tgtaagtgac 60  
tgtttaagct tgtttttcag agagggtttt atgaatacaa acacaataaa aaagggttgta 120  
gcgactggaa ttggagctgc actttttatc attataggta tgctagttaa 170

<210> 112

<211> 56

<212> PRT

<213> Streptococcus agalactiae

<400> 112

Met Ser Ile Arg Phe Gln Ile Ser Leu Lys Tyr Asp Lys Ile Lys Gln  
1 5 10 15

Ile Val Ser Asp Cys Leu Ser Leu Phe Phe Arg Glu Val Phe Met Asn  
20 25 30

Phe Ile Ile Ile Gly Met Leu Val  
50 55

<211> 242

<213> Streptococcus agalactiae

atgaaacatt	taaaatttca	atcgggtcttc	gacattattg	gtcctggtat	gattggacca	60
tcaagtagtc	atactgcagg	agctgtccgc	attggtaaag	ttgtccattc	tattttttggt	120
gaacctagtg	aagtaacctt	tcattttatac	aattcttttg	ctaaaactta	ccaaggacac	180
ggtactgata	aagcattggg	tcgagggtt	ctaggaatgg	atacagataa	tccagatatt	240
aa						242

<211> 80

<213> Streptococcus agalactiae

Met Lys His Leu Lys Phe Gln Ser Val Phe Asp Ile Ile Gly Pro Val  
1 5 10 15

Lys Val Val His Ser Ile Phe Gly Glu Pro Ser Glu Val Thr Phe His  
35 40 45

Leu Tyr Asn Ser Phe Ala Lys Thr Tyr Gln Gly His Gly Thr Asp Lys  
50 55 60

Ala Leu Val Ala Gly Ile Leu Gly Met Asp Thr Asp Asn Pro Asp Ile  
 65 70 75 80

<210> 115

<211> 122

<212> DNA

<213> Streptococcus agalactiae

<400> 115

gtgtcagaag gtgttttaaat gtttctaaaa gaagatgacg tagagacttt tcttcataatc 60  
 ctgacaaaatt catttagcca atttatggca caatttgatt tgtgtcataa ggaaatgatt 120  
 aa 122

<210> 116

<211> 83

<212> DNA

<213> Streptococcus agalactiae

<400> 116

atgacctaca aagattacac aggttttagat cggactgaac ttttgagtaa agtgcgtcat 60  
 atgatgtccg acaaacgttt taa 83

<210> 117

<211> 27

<212> PRT

<213> Streptococcus agalactiae

<400> 117

Met Thr Tyr Lys Asp Tyr Thr Gly Leu Asp Arg Thr Glu Leu Leu Ser  
 1 5 10 15

Lys Val Arg His Met Met Ser Asp Lys Arg Phe

20

25

<210> 118

<211> 94

<212> DNA

<213> Streptococcus agalactiae

<400> 118

ctgagttggg tcttggaac ggtcctgtca atcatactag ctatcaagga gactaaaatg 60  
tatttagaac aactaaaaga ggtaaatcct ttaa 94

<210> 119

<211> 31

<212> PRT

<213> Streptococcus agalactiae

<400> 119

Met Ser Trp Val Leu Glu Thr Val Leu Ser Ile Ile Leu Ala Ile Lys

1

5

10

15

Glu Thr Lys Met Tyr Leu Glu Gln Leu Lys Glu Val Asn Pro Leu

20

25

30

<210> 120

<211> 1230

<212> DNA

<213> Streptococcus agalactiae

<400> 120

gtgaaaaaaaa aattagtctc atcacttcta aagtgttctc taatcattat tgtagcttt 60  
gctggtggag catttgctag ttttgtcatg aatcataatg acaatattcc aaatggtggt 120  
gtcactaaaa ctagttaaagt aaattataat aacataacgc ctacaacaaa agctgttaaa 180  
aaggtaaaaa atagtgttgt ttctgttatc aattataaac aacaagagag tcgttctgac 240

ctatcagact tctatagtca ttttttttggg aatcaggggg gcaacactga taaggggetta 300  
 caagttttacg gtgaaggctc tggagtcac tataaaaaag atggtaaaaa tgccctatggt 360  
 gtcactaata accacgtcat tgatgggggt aaacaaattg aaattcaact agctgatggc 420  
 tcaaaagcag ttgggaaact tgttgggtca gatacctact ctgatttagc cgtcgtcaaa 480  
 attccatcag ataaagtttc aaatattgca gaatttgctg attcatcaaa actcaacatt 540  
 ggtgaaactg ctatagcgat cggaagccct cttggaactg agtatgcaaa ttctgtaact 600  
 caaggtattg tatctagttt aaaaagaact gtaacaatga ctaatgaaga aggacaaaaca 660  
 gtttctacaa atgctatcca gacggatgct gctatcaatc ctggtaattc aggtggagca 720  
 cttatcaata ttgaaggaca gggtattgga attaattcta gtaaaatttc ttctacatca 780  
 aatcaaacct caggacaatc gtcaggaaat agcgttgaag gtatgggatt tgccattcct 840  
 tcaaatgatg ttgttaagat tatcaatcaa cttgagagta acggacaagt agagagacct 900  
 gctotaggta tttctatggc tggattaagt aattttaccat ccgatgttat tagtaaaactg 960  
 aaaatoccaa gtaatgttac taatggtatt gtagtagcat ctatccaatc tggcatgcc 1020  
 gctcaaggca aactaaagaa atacgatgtc attactaaag ttgacgataa agaagtagca 1080  
 tctccaagtg atttacaag tttactctat ggccaccagg taggggattc cataacagta 1140  
 accttttata gtggtgaaaa taaacaaaaca gtcactataa aacttactaa aactagtaaa 1200  
 gatttagcta aacaacgagc aaataactaa 1230

<210> 121

<211> 409

<212> PRT

<213> Streptococcus agalactiae

<400> 121

Met Lys Lys Lys Leu Val Ser Ser Leu Leu Lys Cys Ser Leu Ile Ile

1

5

10

15

Ile Val Ser Phe Ala Gly Gly Ala Phe Ala Ser Phe Val Met Asn His

20

25

30

Asn Asp Asn Ile Pro Asn Gly Gly Val Thr Lys Thr Ser Lys Val Asn

35

40

45

124

Tyr Asn Asn Ile Thr Pro Thr Thr Lys Ala Val Lys Lys Val Gln Asn  
50 55 60

Ser Val Val Ser Val Ile Asn Tyr Lys Gln Gln Glu Ser Arg Ser Asp  
65 70 75 80

Leu Ser Asp Phe Tyr Ser His Phe Phe Gly Asn Gln Gly Gly Asn Thr  
85 90 95

Asp Lys Gly Leu Gln Val Tyr Gly Glu Gly Ser Gly Val Ile Tyr Lys  
100 105 110

Lys Asp Gly Lys Asn Ala Tyr Val Val Thr Asn Asn His Val Ile Asp  
115 120 125

Gly Ala Lys Gln Ile Glu Ile Gln Leu Ala Asp Gly Ser Lys Ala Val  
130 135 140

Gly Lys Leu Val Gly Ser Asp Thr Tyr Ser Asp Leu Ala Val Val Lys  
145 150 155 160

Ile Pro Ser Asp Lys Val Ser Asn Ile Ala Glu Phe Ala Asp Ser Ser  
165 170 175

Lys Leu Asn Ile Gly Glu Thr Ala Ile Ala Ile Gly Ser Pro Leu Gly  
180 185 190

Thr Glu Tyr Ala Asn Ser Val Thr Gln Gly Ile Val Ser Ser Leu Lys  
195 200 205

Arg Thr Val Thr Met Thr Asn Glu Glu Gly Gln Thr Val Ser Thr Asn  
210 215 220

Ala Ile Gln Thr Asp Ala Ala Ile Asn Pro Gly Asn Ser Gly Gly Ala  
225 230 235 240

Leu Ile Asn Ile Glu Gly Gln Val Ile Gly Ile Asn Ser Ser Lys Ile  
245 250 255

125

Ser Ser Thr Ser Asn Gln Thr Ser Gly Gln Ser Ser Gly Asn Ser Val  
260 265 270

Glu Gly Met Gly Phe Ala Ile Pro Ser Asn Asp Val Val Lys Ile Ile  
275 280 285

Asn Gln Leu Glu Ser Asn Gly Gln Val Glu Arg Pro Ala Leu Gly Ile  
290 295 300

Ser Met Ala Gly Leu Ser Asn Leu Pro Ser Asp Val Ile Ser Lys Leu  
305 310 315 320

Lys Ile Pro Ser Asn Val Thr Asn Gly Ile Val Val Ala Ser Ile Gln  
325 330 335

Ser Gly Met Pro Ala Gln Gly Lys Leu Lys Lys Tyr Asp Val Ile Thr  
340 345 350

Lys Val Asp Asp Lys Glu Val Ala Ser Pro Ser Asp Leu Gln Ser Leu  
355 360 365

Leu Tyr Gly His Gln Val Gly Asp Ser Ile Thr Val Thr Phe Tyr Arg  
370 375 380

Gly Glu Asn Lys Gln Thr Val Thr Ile Lys Leu Thr Lys Thr Ser Lys  
385 390 395 400

Asp Leu Ala Lys Gln Arg Ala Asn Asn  
405

<210> 122

<211> 1923

<212> DNA

<213> Streptococcus agalactiae

<400> 122

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atgtgttag ctcttagttt ttttatgggt tcagttcaag cagatgaggt ggactataac 120

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 aaggttactt accaatttga ttctcctat aatggacagt atgtcacgtt aggtacggcg 240  
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 ggtaaagtaa ggaaagttag ttaccagata gaagatttgg aggatggcta ccgtttgaaa 360  
 gtgtttaatg gtggtgaagc aggtgatact gttaaagtca atgttcagtg gaaactaaaa 420  
 aatgttctat ttatgcataa ggatgttggg gaacttaact ggattcctat tagcgactgg 480  
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 taa 1923

<210> 123

<211> 640

<212> PRT

<213> Streptococcus agalactiae

&lt;400&gt; 123

Met Leu Lys Trp Tyr Thr Asn Lys Gly Gly Arg Met Ile Met Lys Lys  
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Cys Phe Leu Ala Ile Cys Leu Ala Leu Ser Phe Phe Met Val Ser Val  
 20 25 30

Gln Ala Asp Glu Val Asp Tyr Asn Ile Pro His Tyr Glu Gly Asn Leu  
 35 40 45

Thr Ile His Asn Asp Asn Ser Ala Asp Phe Thr Glu Lys Val Thr Tyr  
 50 55 60

Gln Phe Asp Ser Ser Tyr Asn Gly Gln Tyr Val Thr Leu Gly Thr Ala  
 65 70 75 80

Gly Lys Leu Ser Asp Asn Phe Asp Ile Asn Asn Lys Pro Gln Val Glu  
 85 90 95

Val Ser Ile Asn Gly Lys Val Arg Lys Val Ser Tyr Gln Ile Glu Asp  
 100 105 110

Leu Glu Asp Gly Tyr Arg Leu Lys Val Phe Asn Gly Gly Glu Ala Gly  
 115 120 125

Asp Thr Val Lys Val Asn Val Gln Trp Lys Leu Lys Asn Val Leu Phe  
 130 135 140

Met His Lys Asp Val Gly Glu Leu Asn Trp Ile Pro Ile Ser Asp Trp  
 145 150 155 160

Asp Lys Thr Leu Glu Lys Val Asp Phe Trp Ile Ser Thr Asp Lys Lys  
 165 170 175

Val Ala Leu Ser Arg Leu Trp Gly His Leu Gly Tyr Leu Lys Thr Pro  
 180 185 190

Leu Phe Ser Asn Tyr Gln Phe Ser Tyr Lys Glu Thr Leu Arg Glu Leu  
385                      390                      395                      400

129

Lys Lys Gln His Lys Ala Ser Asp Leu Gln Asn Gln Met Arg Arg Arg  
405 410 415

Gly Ser Asn Ala Leu Ser Arg Ile Thr Arg Leu Thr Arg Leu Ile Ser  
420 425 430

Lys Asp Asn Ile Asn Ser Leu Arg Arg Lys Gly Ile Ser Ser Pro Tyr  
435 440 445

Arg Lys Met Ser Ser Glu Glu Ser Lys Glu Leu Ser Arg Leu Lys Arg  
450 455 460

Phe Ser Tyr Leu Ser Pro Leu Ile Ser Phe Val Val Ile Ile Tyr Thr  
465 470 475 480

Leu Phe Leu Asn Tyr Phe Thr Tyr Phe Cys Ile Tyr Leu Leu Leu Phe  
485 490 495

Gly Val Ile Leu Leu Leu Asn Lys Ile Ile Phe Met Met Thr Arg Lys  
500 505 510

Ile Ser Asn Gly Tyr Ile Val Thr Glu Asp Gly Ala Ser Arg Val Tyr  
515 520 525

Gln Trp Thr Ser Phe Arg Asn Met Leu Arg Asp Ile Lys Ser Phe Asp  
530 535 540

Arg Ser Glu Leu Glu Ser Ile Val Leu Trp Asn Arg Ile Leu Val Tyr  
545 550 555 560

Ala Thr Leu Phe Gly Tyr Ala Asp Arg Val Glu Lys Val Leu Arg Val  
565 570 575

Asn Gln Ile Asp Ile Pro Glu Arg Phe Ala Asn Ile Asp Ser His Arg  
580 585 590

Phe Ala Ile Ser Val Asn Gln Ser Ser Asn His Phe Ser Thr Ile Thr  
595 600 605

Glu Asp Val Ser His Ala Ser Asn Phe Ser Val Asn Ser Gly Gly Ser  
 610 615 620

Ser Gly Gly Phe Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Ala Phe  
 625 630 635 640

<210> 124

<211> 2712

<212> DNA

<213> *Streptococcus agalactiae*

<400> 124

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 caaggtgaaa cccaagatac caatcaagca cttggaaaag taattgttaa aaaaacggga 180  
 gacaatgcta caccattagg caaagcgact tttgtgttaa aaaatgacaa tgataagtca 240  
 gaaacaagtc acgaaacggg agagggttct ggagaagcaa cctttgaaaa cataaaacct 300  
 ggagactaca cattaagaga agaaacagca ccaattgggt ataaaaaac tgataaaacc 360  
 tggaaagtta aagttgcaga taacggagca acaataatcg aggggtatga tgcagataaa 420  
 gcagagaaac gaaaagaagt tttgaatgac caatatccaa aatcagctat ttatgaggat 480  
 aaaaaagaaa attaccatt agttaatgta gaggggtcca aagttggtga acaatacaaa 540  
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 aaaaaaatc caggggtcaa tgatctogat aagaataaat ataaaattga attaaactgtt 660  
 gagggtaaaa ccactgttga aacgaaagaa cttaataaac cactagatgt cgttgtgcta 720  
 ttagataatt caaatagtat gaataatgaa agagccaata attctcaaag agcattaaaa 780  
 gctggggaag cagttgaaaa gctgattgat aaaattacat caaataaaga caatagagta 840  
 gctcttgtga catatgcctc aaccattttt gatgggtactg aagcgaccgt atcaaaaggga 900  
 gttgccgac aaaatggtta agcgtgaat gatagtgtat catgggatta tcataaaaact 960  
 acttttacag caactacaca taattacagt tatttaaatt taacaaatga tgctaacgaa 1020  
 gttaatatcc taaagtcaag aattccaaag gaagcggagc atataaatgg ggatcgacacg 1080  
 ctctatcaat ttggtgcgac atttactcaa aaagctctaa tgaaagcaaa tgaaatttta 1140  
 gagacacaaa gttctaattgc tagaaaaaaa cttatttttc acgtaactga tgggtgtccct 1200  
 acgatgtctt atgccataaa ttttaattct tatatatcaa catcttacca aaaccagttt 1260

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aaacaattgt aa 2712

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<210> 125

<211> 903

<212> PRT

<213> Streptococcus agalactiae

<400> 125

Met Met Ile Val Asn Asn Gly Tyr Leu Glu Gly Arg Lys Met Lys Lys

1

5

10

15

Arg Gln Lys Ile Trp Arg Gly Leu Ser Val Thr Leu Leu Ile Leu Ser

20

25

30

Gln Ile Pro Phe Gly Ile Leu Val Gln Gly Glu Thr Gln Asp Thr Asn  
 35 40 45

Gln Ala Leu Gly Lys Val Ile Val Lys Lys Thr Gly Asp Asn Ala Thr  
 50 55 60

Pro Leu Gly Lys Ala Thr Phe Val Leu Lys Asn Asp Asn Asp Lys Ser  
 65 70 75 80

Glu Thr Ser His Glu Thr Val Glu Gly Ser Gly Glu Ala Thr Phe Glu  
 85 90 95

Asn Ile Lys Pro Gly Asp Tyr Thr Leu Arg Glu Glu Thr Ala Pro Ile  
 100 105 110

Gly Tyr Lys Lys Thr Asp Lys Thr Trp Lys Val Lys Val Ala Asp Asn  
 115 120 125

Gly Ala Thr Ile Ile Glu Gly Met Asp Ala Asp Lys Ala Glu Lys Arg  
 130 135 140

Lys Glu Val Leu Asn Ala Gln Tyr Pro Lys Ser Ala Ile Tyr Glu Asp  
 145 150 155 160

Thr Lys Glu Asn Tyr Pro Leu Val Asn Val Glu Gly Ser Lys Val Gly  
 165 170 175

Glu Gln Tyr Lys Ala Leu Asn Pro Ile Asn Gly Lys Asp Gly Arg Arg  
 180 185 190

Glu Ile Ala Glu Gly Trp Leu Ser Lys Lys Asn Pro Gly Val Asn Asp  
 195 200 205

Leu Asp Lys Asn Lys Tyr Lys Ile Glu Leu Thr Val Glu Gly Lys Thr  
 210 215 220

Thr Val Glu Thr Lys Glu Leu Asn Gln Pro Leu Asp Val Val Val Leu  
 225 230 235 240

Leu Asp Asn Ser Asn Ser Met Asn Asn Glu Arg Ala Asn Asn Ser Gln  
 245 250 255

Arg Ala Leu Lys Ala Gly Glu Ala Val Glu Lys Leu Ile Asp Lys Ile  
 260 265 270

Thr Ser Asn Lys Asp Asn Arg Val Ala Leu Val Thr Tyr Ala Ser Thr  
 275 280 285

Ile Phe Asp Gly Thr Glu Ala Thr Val Ser Lys Gly Val Ala Asp Gln  
 290 295 300

Asn Gly Lys Ala Leu Asn Asp Ser Val Ser Trp Asp Tyr His Lys Thr  
 305 310 315 320

Thr Phe Thr Ala Thr Thr His Asn Tyr Ser Tyr Leu Asn Leu Thr Asn  
 325 330 335

Asp Ala Asn Glu Val Asn Ile Leu Lys Ser Arg Ile Pro Lys Glu Ala  
 340 345 350

Glu His Ile Asn Gly Asp Arg Thr Leu Tyr Gln Phe Gly Ala Thr Phe  
 355 360 365

Thr Gln Lys Ala Leu Met Lys Ala Asn Glu Ile Leu Glu Thr Gln Ser  
 370 375 380

Ser Asn Ala Arg Lys Lys Leu Ile Phe His Val Thr Asp Gly Val Pro  
 385 390 395 400

Thr Met Ser Tyr Ala Ile Asn Phe Asn Pro Tyr Ile Ser Thr Ser Tyr  
 405 410 415

Gln Asn Gln Phe Asn Ser Phe Leu Asn Lys Ile Pro Asp Arg Ser Gly  
 420 425 430

Ile Leu Gln Glu Asp Phe Ile Ile Asn Gly Asp Asp Tyr Gln Ile Val  
 435 440 445

Leu Lys Asn Gly Val Ala Leu Gly Gly Pro Asn Ser Asp Gly Gly Ile  
645 650 655

Gln Ile Gly Tyr Leu Glu Gly Asn Gly Lys His Leu Ile Thr Asn Thr  
850 855 860

Pro Lys Arg Pro Pro Gly Val Phe Pro Lys Thr Gly Gly Ile Gly Thr  
 865 870 875 880

Ile Val Tyr Ile Leu Val Gly Ser Thr Phe Met Ile Leu Thr Ile Cys  
 885 890 895

Ser Phe Arg Arg Lys Gln Leu  
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<210> 126

<211> 1251

<212> DNA

<213> Streptococcus agalactiae

<400> 126

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 gaagtactgg ctcatcttagc agaagtacca aaacctaagg aactattaga aatattaaat 240  
 caatatgttg tagggcaaga tcgtgctaaa cgtgctttag cagttgctgt ctacaatcat 300  
 tacaagcgtg ttaggttatac cgagagtagt gacgatgatg tagatttgca aaaatccaac 360  
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 agccttaatg taccgtttgc tattgcagat gcgacttcat tgaccgaagc aggatacgtt 480  
 ggagaagatg ttgagaatat tcttcttaaa ttgattcaag ctgctgatta taatgtcgaa 540  
 cgtgctgagc gtggtattat ctacgttgat gaaatagata aaattgctaa gaaaggcgaa 600  
 aatgtttcta tcacacgtga tgtgtctggt gaaggtgtac agcaagccct tcttaaaatt 660  
 attgagggta cggtagcaag tgttcccca caggggtgggc gtaaaccatcc taaccaagaa 720  
 atgattcaaa ttaataccaa gaacatcctt tttattgtog gtggtgcttt tgatgggtatt 780  
 gaagaccttg tgaagcaacg tttaggcgaa aaagttattg gttttggaca gacaagccgt 840  
 aaaattgatg acaacgcttc ttatatgcaa gagataattt ctgaggatat tcaaaagt 900  
 ggactgattc cagagtttat tggccgttta ccagtagttg cagcgttaga acttottaact 960  
 gcagaagatc tggttcgtat tctgacagaa ccacgcaatg ctttggttaa acaataccaa 1020  
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 gctgataagg ctatcgagcg caagactggt gcacgtgggt tacgttctat tattgaagaa 1140  
 acgatgcttg atatcatggt tgaaattcca agccaagaag atgtaacaaa agttcgtatc 1200  
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&lt;210&gt; 127

&lt;211&gt; 416

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 127

Met Asn Arg Lys Val Glu Glu Lys Met Ala Gly Asn Arg Asn Asn Asp  
 1 5 10 15

Met Asn Val Tyr Cys Ser Phe Cys Gly Lys Ser Gln Asp Glu Val Lys  
 20 25 30

Lys Ile Ile Ala Gly Asn Gly Val Phe Ile Cys Asn Glu Cys Val Ala  
 35 40 45

Leu Ser Gln Glu Ile Ile Lys Glu Glu Leu Ala Glu Glu Val Leu Ala  
 50 55 60

His Leu Ala Glu Val Pro Lys Pro Lys Glu Leu Leu Glu Ile Leu Asn  
 65 70 75 80

Gln Tyr Val Val Gly Gln Asp Arg Ala Lys Arg Ala Leu Ala Val Ala  
 85 90 95

Val Tyr Asn His Tyr Lys Arg Val Ser Tyr Thr Glu Ser Ser Asp Asp  
 100 105 110

Asp Val Asp Leu Gln Lys Ser Asn Ile Leu Met Ile Gly Pro Thr Gly  
 115 120 125

Ser Gly Lys Thr Phe Leu Ala Gln Thr Leu Ala Lys Ser Leu Asn Val  
 130 135 140

Pro Phe Ala Ile Ala Asp Ala Thr Ser Leu Thr Glu Ala Gly Tyr Val  
 145 150 155 160

138

Gly Glu Asp Val Glu Asn Ile Leu Leu Lys Leu Ile Gln Ala Ala Asp  
165 170 175

Tyr Asn Val Glu Arg Ala Glu Arg Gly Ile Ile Tyr Val Asp Glu Ile  
180 185 190

Asp Lys Ile Ala Lys Lys Gly Glu Asn Val Ser Ile Thr Arg Asp Val  
195 200 205

Ser Gly Glu Gly Val Gln Gln Ala Leu Leu Lys Ile Ile Glu Gly Thr  
210 215 220

Val Ala Ser Val Pro Pro Gln Gly Gly Arg Lys His Pro Asn Gln Glu  
225 230 235 240

Met Ile Gln Ile Asn Thr Lys Asn Ile Leu Phe Ile Val Gly Gly Ala  
245 250 255

Phe Asp Gly Ile Glu Asp Leu Val Lys Gln Arg Leu Gly Glu Lys Val  
260 265 270

Ile Gly Phe Gly Gln Thr Ser Arg Lys Ile Asp Asp Asn Ala Ser Tyr  
275 280 285

Met Gln Glu Ile Ile Ser Glu Asp Ile Gln Lys Phe Gly Leu Ile Pro  
290 295 300

Glu Phe Ile Gly Arg Leu Pro Val Val Ala Ala Leu Glu Leu Leu Thr  
305 310 315 320

Ala Glu Asp Leu Val Arg Ile Leu Thr Glu Pro Arg Asn Ala Leu Val  
325 330 335

Lys Gln Tyr Gln Thr Leu Leu Ser Tyr Asp Gly Val Glu Leu Glu Phe  
340 345 350

Asp Gln Asp Ala Leu Leu Ala Ile Ala Asp Lys Ala Ile Glu Arg Lys  
355 360 365

Thr Gly Ala Arg Gly Leu Arg Ser Ile Ile Glu Glu Thr Met Leu Asp  
 370 375 380

Ile Met Phe Glu Ile Pro Ser Gln Glu Asp Val Thr Lys Val Arg Ile  
 385 390 395 400

Thr Lys Ala Ala Val Glu Gly Thr Asp Lys Pro Val Leu Glu Thr Ala  
 405 410 415

<210> 128

<211> 786

<212> DNA

<213> Streptococcus agalactiae

<400> 128

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 aattcatctg ttgatacgag ccaggaattht caaaataatt taaaaaatgc tattggtaac 180  
 ctaccatttc aatatgttaa tggtatttat gaattaaata ataatcagac aaattttaat 240  
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 actgctaattg caatgcttga tagaaccatt cgtcaatatc aaaatcgcag agataccact 360  
 cttcccgatg caaattggaa accattaggt tggcatcaag tagctactaa tgaccattat 420  
 gggcatgcag tcgacaaggg gcatttaatt gcctatgctt tagctggaaa tttcaaagggt 480  
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 tcaaatcaaa aaatcaatcg tggacaaaat tattatgaaa gcttagttcg taaggcgggt 600  
 gaccaaaaca aacgtgttcg ttaccgtgta actccattgt accgtaatga tactgattta 660  
 gttccatttg caatgcacct agaagctaaa tcacaagatg gcacattaga atttaatggt 720  
 gctattccaa acacacaagc atcatacact atggattatg caacaggaga aataacacta 780  
 aattaa 786

&lt;210&gt; 129

&lt;211&gt; 261

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 129

Met Lys Arg Leu His Lys Leu Phe Ile Thr Val Ile Ala Thr Leu Gly

1

5

10

15

Met Leu Gly Val Met Thr Phe Gly Leu Pro Thr Gln Pro Gln Asn Val

20

25

30

Thr Pro Ile Val His Ala Asp Val Asn Ser Ser Val Asp Thr Ser Gln

35

40

45

Glu Phe Gln Asn Asn Leu Lys Asn Ala Ile Gly Asn Leu Pro Phe Gln

50

55

60

Tyr Val Asn Gly Ile Tyr Glu Leu Asn Asn Asn Gln Thr Asn Leu Asn

65

70

75

80

Ala Asp Val Asn Val Lys Ala Tyr Val Gln Asn Thr Ile Asp Asn Gln

85

90

95

Gln Arg Leu Ser Thr Ala Asn Ala Met Leu Asp Arg Thr Ile Arg Gln

100

105

110

Tyr Gln Asn Arg Arg Asp Thr Thr Leu Pro Asp Ala Asn Trp Lys Pro

115

120

125

Leu Gly Trp His Gln Val Ala Thr Asn Asp His Tyr Gly His Ala Val

130

135

140

Asp Lys Gly His Leu Ile Ala Tyr Ala Leu Ala Gly Asn Phe Lys Gly

145

150

155

160

Trp Asp Ala Ser Val Ser Asn Pro Gln Asn Val Val Thr Gln Thr Ala

165

170

175

141

His Ser Asn Gln Ser Asn Gln Lys Ile Asn Arg Gly Gln Asn Tyr Tyr  
180 185 190

Glu Ser Leu Val Arg Lys Ala Val Asp Gln Asn Lys Arg Val Arg Tyr  
195 200 205

Arg Val Thr Pro Leu Tyr Arg Asn Asp Thr Asp Leu Val Pro Phe Ala  
210 215 220

Met His Leu Glu Ala Lys Ser Gln Asp Gly Thr Leu Glu Phe Asn Val  
225 230 235 240

Ala Ile Pro Asn Thr Gln Ala Ser Tyr Thr Met Asp Tyr Ala Thr Gly  
245 250 255

Glu Ile Thr Leu Asn  
260

<210> 130

<211> 621

<212> DNA

<213> Streptococcus agalactiae

<400> 130

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aaaactctac ctgtggtaaa tcagattaag cctcaaacca ttaaagaata ccaaaattac 180  
ttaactaagg tagctaaacg taatgttctt cctgtagaca ttcttcaggc attaaataat 240  
gaaaaggtag aaattactgc tactgatggc atgcaaacat tcacttggaa tgataaaaaat 300  
aatcctaagc aaaaggttat ottotatggt catggaggat catatatcca tcaagcttcc 360  
gaattacaat atattttttgt caataaaacta gctaaaaaat tagatgcaaa agttgtcttt 420  
cctattttacc ctaaagctcc tacatataat tatagtgatg ctatccccc aaataaaaaa 480  
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agtgcaggcg gaggccttgc tttaggtatt gctgataacc ttgcacggag catatcaaac 600  
aaccaaaaga aattatttta a 621

&lt;210&gt; 131

&lt;211&gt; 206

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 131

Met Lys Asn Tyr Arg Lys Leu Ile Val Leu Leu Leu Ile Phe Phe

1 5 10 15

Ala Ile Phe Met Gly Ala Tyr Ala Tyr Thr His Ile Val Glu Lys Arg

20 25 30

Ser Leu Thr Ser Asn Thr Ile Glu Lys Thr Leu Pro Val Val Asn Gln

35 40 45

Ile Lys Pro Gln Thr Ile Lys Glu Tyr Gln Asn Tyr Leu Thr Lys Val

50 55 60

Ala Lys Arg Asn Val Leu Pro Val Asp Ile Pro Gln Ala Leu Asn Asn

65 70 75 80

Glu Lys Val Glu Ile Thr Ala Thr Asp Gly Met Gln Thr Phe Thr Trp

85 90 95

Asn Asp Lys Asn Asn Pro Lys Gln Lys Val Ile Phe Tyr Val His Gly

100 105 110

Gly Ser Tyr Ile His Gln Ala Ser Glu Leu Gln Tyr Ile Phe Val Asn

115 120 125

Lys Leu Ala Lys Lys Leu Asp Ala Lys Val Val Phe Pro Ile Tyr Pro

130 135 140

Lys Ala Pro Thr Tyr Asn Tyr Ser Asp Ala Ile Pro Lys Ile Lys Lys

145 150 155 160

Leu Tyr Gln Asn Thr Leu Ala Ser Val Thr Ser His Lys Gln Ile Ile

165 170 175

143

Leu Val Gly Glu Ser Ala Gly Gly Gly Leu Ala Leu Gly Ile Ala Asp  
180 185 190

Asn Leu Ala Arg Ser Ile Ser Asn Asn Gln Lys Lys Leu Phe  
195 200 205

<210> 132

<211> 885

<212> DNA

<213> Streptococcus agalactiae

<400> 132

ttgattctaa taacttccta tgggataata tctttatcac aaaaattgag ggaatttatt 60  
atgaagttaa aacatattgt cttaggatta gccttaacaa cacttttagg agtcacattt 120  
agtaatcaag aagtttcagc aagctcaact tcaagtaaag ttgttaaagt tgggtgttatg 180  
accttttctg acactgaaaa agcacgttgg gataaaattg aaaagctagt aggtgataaa 240  
gctaaaatca aattttacaga atttacagat tatacacaac caaatcaagc gacagccaat 300  
aaggatgtgg atattaatgc ctttcaacat tacaatttct tagaaaactg gaataaggaa 360  
aataagaaaa acttaattcc acttgaaaag acttacttag ctccaattcg tatctattct 420  
gagaaggtaa aatctcttaa aaaattgaaa aaaggagcca ctattgcaat tccaaatgat 480  
gcaacaaatg gtagccgtgc attgtatgtc cttcagtcag caggtttaat caaattgaat 540  
gtttctggtg agaaggttgc aacagttgct aatatcacat ctaataaaaa ggatattaat 600  
attcaggagt tagatgcgag tcaaacacca cgtgcactca aagatgtaga tgcagctatt 660  
attaataata catacattga gcaagctaatt ttaaaacctt cagatgctat ctttgttgag 720  
aaatcagata aaaattcaaa acaatggatt aatatcattg cgggacgtaa aaattggaaa 780  
aagcaaaaga acgctaaagc tatccaagct atcttgatg cttatcacac agatgaagtg 840  
aaaaaagtta tcaaagatac ttcagctgat attccacaat ggtaa 885

<210> 133

<211> 294

<212> PRT

<213> Streptococcus agalactiae

<400> 133

Met Ile Leu Ile Thr Ser Tyr Gly Ile Ile Ser Leu Ser Gln Lys Leu  
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Arg Glu Phe Ile Met Lys Leu Lys His Ile Val Leu Gly Leu Ala Leu  
 20 25 30

Thr Thr Leu Leu Gly Val Thr Phe Ser Asn Gln Glu Val Ser Ala Ser  
 35 40 45

Ser Thr Ser Ser Lys Val Val Lys Val Gly Val Met Thr Phe Ser Asp  
 50 55 60

Thr Glu Lys Ala Arg Trp Asp Lys Ile Glu Lys Leu Val Gly Asp Lys  
 65 70 75 80

Ala Lys Ile Lys Phe Thr Glu Phe Thr Asp Tyr Thr Gln Pro Asn Gln  
 85 90 95

Ala Thr Ala Asn Lys Asp Val Asp Ile Asn Ala Phe Gln His Tyr Asn  
 100 105 110

Phe Leu Glu Asn Trp Asn Lys Glu Asn Lys Lys Asn Leu Ile Pro Leu  
 115 120 125

Glu Lys Thr Tyr Leu Ala Pro Ile Arg Ile Tyr Ser Glu Lys Val Lys  
 130 135 140

Ser Leu Lys Lys Leu Lys Lys Gly Ala Thr Ile Ala Ile Pro Asn Asp  
 145 150 155 160

Ala Thr Asn Gly Ser Arg Ala Leu Tyr Val Leu Gln Ser Ala Gly Leu  
 165 170 175

Ile Lys Leu Asn Val Ser Gly Lys Lys Val Ala Thr Val Ala Asn Ile  
 180 185 190

Thr Ser Asn Lys Lys Asp Ile Asn Ile Gln Glu Leu Asp Ala Ser Gln  
 195 200 205

Thr Pro Arg Ala Leu Lys Asp Val Asp Ala Ala Ile Ile Asn Asn Thr  
 210 215 220

145

Tyr Ile Glu Gln Ala Asn Leu Lys Pro Ser Asp Ala Ile Phe Val Glu  
225 230 235 240

Lys Ser Asp Lys Asn Ser Lys Gln Trp Ile Asn Ile Ile Ala Gly Arg  
245 250 255

Lys Asn Trp Lys Lys Gln Lys Asn Ala Lys Ala Ile Gln Ala Ile Leu  
260 265 270

Asp Ala Tyr His Thr Asp Glu Val Lys Lys Val Ile Lys Asp Thr Ser  
275 280 285

Ala Asp Ile Pro Gln Trp  
290

<210> 134

<211> 1350

<212> DNA

<213> Streptococcus agalactiae

<400> 134

atgtcaaatac aatatgatta tatcggttatt ggtggaggta gtgcaggcag tgggtaccgct 60  
aatagggcag ccatgtatgg agcaaaagtc ctgttaattg aagggtggaca agtaggtgga 120  
acttggtgta acttaggttg tgtacctaatg aaaatcatgt ggtatggtgc acaagtttct 180  
gagacactcc ataagtatat ttcagggttat ggttttgaag ccaataatct tagttttgat 240  
tttactactc taaaagctaa tcgcgatgct tacgtgcagc ggtctagaca gtcgtatgcc 300  
gctaattttg agcgtaattg ggtcgaaaag attgatggat ttgctcgttt tattgataac 360  
catactattg aagtgaatgg tcagcaatat aaagctcttc acattactat tgcaacaggt 420  
ggacacctc tttacctga tattattgga agtgaacttg gtgagacttc tgatgatttt 480  
tttggtatgg agaccttacc aaattctata ttgattggtg gggcgggcta tatcgcgga 540  
gaacttgctg gagggtttaa tgaattaggc gttgaaacct atcttgcat tagaaaagac 600  
catattctac gcggatttga tgacatggta acaagtgagg ttatggctga aatggagaaa 660  
tcaggatatc ctttacctg taacctatgta cctaaatctc ttaaaccgca tgaaggtggc 720  
aagttgattt ttgaagctga aaatgggaaa acgcttgctg ttgatcgtgt aatatgggct 780  
atcgccctg gaccaaattg agacatggga cttgaaaata ccgatattgt tttaaatgat 840  
aaagattata tcaaaacaga tgaatttgag aatacttctg tagatggcgt gtatgctatt 900

<210> 135

<212> PRT

<213> Streptococcus agalactiae

<400> 135

Ser Gly Thr Ala Asn Arg Ala Ala Met Tyr Gly Ala Lys Val Leu Leu  
20 25 30

Pro Lys Lys Ile Met Trp Tyr Gly Ala Gln Val Ser Glu Thr Leu His  
50 55 60

Lys Tyr Ser Ser Gly Tyr Gly Phe Glu Ala Asn Asn Leu Ser Phe Asp  
65 70 75 80

Phe Thr Thr Leu Lys Ala Asn Arg Asp Ala Tyr Val Gln Arg Ser Arg  
85 90 95

Gln Ser Tyr Ala Ala Asn Phe Glu Arg Asn Gly Val Glu Lys Ile Asp  
100 105 110

Gly Phe Ala Arg Phe Ile Asp Asn His Thr Ile Glu Val Asn Gly Gln  
115 120 125

147

Gln Tyr Lys Ala Pro His Ile Thr Ile Ala Thr Gly Gly His Pro Leu  
130 135 140

Tyr Pro Asp Ile Ile Gly Ser Glu Leu Gly Glu Thr Ser Asp Asp Phe  
145 150 155 160

Phe Gly Trp Glu Thr Leu Pro Asn Ser Ile Leu Ile Val Gly Ala Gly  
165 170 175

Tyr Ile Ala Ala Glu Leu Ala Gly Val Val Asn Glu Leu Gly Val Glu  
180 185 190

Thr His Leu Ala Phe Arg Lys Asp His Ile Leu Arg Gly Phe Asp Asp  
195 200 205

Met Val Thr Ser Glu Val Met Ala Glu Met Glu Lys Ser Gly Ile Ser  
210 215 220

Leu His Ala Asn His Val Pro Lys Ser Leu Lys Arg Asp Glu Gly Gly  
225 230 235 240

Lys Leu Ile Phe Glu Ala Glu Asn Gly Lys Thr Leu Val Val Asp Arg  
245 250 255

Val Ile Trp Ala Ile Gly Arg Gly Pro Asn Val Asp Met Gly Leu Glu  
260 265 270

Asn Thr Asp Ile Val Leu Asn Asp Lys Asp Tyr Ile Lys Thr Asp Glu  
275 280 285

Phe Glu Asn Thr Ser Val Asp Gly Val Tyr Ala Ile Gly Asp Val Asn  
290 295 300

Gly Lys Ile Ala Leu Thr Pro Val Ala Ile Ala Ala Gly Arg Arg Leu  
305 310 315 320

Ser Glu Arg Leu Phe Asn His Lys Asp Asn Glu Lys Leu Asp Tyr His  
325 330 335

147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400

148

Asn Val Pro Ser Val Ile Phe Thr His Pro Val Ile Gly Thr Val Gly  
340 345 350

Leu Ser Glu Ala Ala Ala Ile Glu Gln Phe Gly Lys Asp Asn Ile Lys  
355 360 365

Val Tyr Thr Ser Thr Phe Thr Ser Met Tyr Thr Ala Val Thr Ser Asn  
370 375 380

Arg Gln Ala Val Lys Met Lys Leu Ile Thr Leu Gly Lys Glu Glu Lys  
385 390 395 400

Val Ile Gly Leu His Gly Val Gly Tyr Gly Ile Asp Glu Met Ile Gln  
405 410 415

Gly Phe Ser Val Ala Ile Lys Met Gly Ala Thr Lys Ala Asp Phe Asp  
420 425 430

Asp Thr Val Ala Ile His Pro Thr Gly Ser Glu Glu Phe Val Thr Met  
435 440 445

Arg

<210> 136

<211> 1317

<212> DNA

<213> Streptococcus agalactiae

<400> 136

atgagtatca aaaaaagtgt gattggtttt tgcctcgaag ctgcagcatt atcaatgttt 60  
gcttgtagtag acagtagtca atctgttatg gctgccgaga aggataaagt cgaaattacg 120  
tggtgggctt ttccaacctt tactcaagaa aaggctaagg atggagtagg tacttatgag 180  
aaaaaagtca tcaaggcttt tgaaaaagaaa aatcctaata taaaagtaaa actagagaca 240  
attgatttca catctggacc tgaaaaaatc actacagcaa ttgaagcagg gacagcacct 300  
gatgtgcttt ttgatgcacc agggcgaatt attcaatatg gtaaaaatgg taaattagca 360

gatttgaatg atttatttac agaccaattht attaaggatg tcaataataa gaacatcatt 420  
 caagcttcta agtctggcga taaagcctac atgtatccaa taagttctgc cccattttat 480  
 atggcggttca ataaaaaaat gcttaaagat gcaggagttt tgaaacttgt aaaagaaggt 540  
 tggactacta gtgattttga aaaagtacta aaagcactaa aaaataaagg ctatacacca 600  
 ggttcattct ttgcaaacgg gcaaggagga gatcaaggac cacgtgcatt ttttgctaatt 660  
 ctttatagtg ctccaataac agataaagaa gtaacaaaat ataccactga cactaaaaat 720  
 tctgtaaaat caatgaaaaa aatagttgaa tggattaaga aaggctactt gatgaatggg 780  
 tctcagtatg atggctcagc tgacattcaa aacttcgccca atggacaaaac tgcttttact 840  
 atcctatggg ctccagctca accaaaaact caagcaaaaat tattagagtc aagtaaagtg 900  
 gattaccttg aagtgccatt cccatcagaa gatggaaaac cagattttaga ataccttggtt 960  
 aatggttttg cgggtctttaa taataaagat gaaaacaaaag taaaagcctc taagaaattt 1020  
 atcactttta ttgctgatga taaaaaatgg ggaccaaaaag atgttatatc tacaggtgct 1080  
 ttcccagtta gaacatcatt tggggatctt tataaagggtg ataaacgtat gatgaagatt 1140  
 tcaaaatgga ctcaatatta ttcaccatat tacaacacta tcgatggatt ttctgaaatg 1200  
 agaaccttat ggttcccaat ggttcaatct gtatccaatg gtgatgaaaa accagcagat 1260  
 gctttgaaag actttactca aaaagcaaat gataaccatta aaaaagcagc taaataa 1317

<210> 137

<211> 438

<212> PRT

<213> Streptococcus agalactiae

<400> 137

Met Ser Ile Lys Lys Ser Val Ile Gly Phe Cys Leu Glu Ala Ala Ala

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Leu Ser Met Phe Ala Cys Val Asp Ser Ser Gln Ser Val Met Ala Ala

20

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Glu Lys Asp Lys Val Glu Ile Thr Trp Trp Ala Phe Pro Thr Phe Thr

35

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45

Gln Glu Lys Ala Lys Asp Gly Val Gly Thr Tyr Glu Lys Lys Val Ile

50

55

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Lys Ala Phe Glu Lys Lys Asn Pro Asn Ile Lys Val Lys Leu Glu Thr

65

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150

Ile Asp Phe Thr Ser Gly Pro Glu Lys Ile Thr Thr Ala Ile Glu Ala  
85 90 95

Gly Thr Ala Pro Asp Val Leu Phe Asp Ala Pro Gly Arg Ile Ile Gln  
100 105 110

Tyr Gly Lys Asn Gly Lys Leu Ala Asp Leu Asn Asp Leu Phe Thr Asp  
115 120 125

Gln Phe Ile Lys Asp Val Asn Asn Lys Asn Ile Ile Gln Ala Ser Lys  
130 135 140

Ser Gly Asp Lys Ala Tyr Met Tyr Pro Ile Ser Ser Ala Pro Phe Tyr  
145 150 155 160

Met Ala Phe Asn Lys Lys Met Leu Lys Asp Ala Gly Val Leu Lys Leu  
165 170 175

Val Lys Glu Gly Trp Thr Thr Ser Asp Phe Glu Lys Val Leu Lys Ala  
180 185 190

Leu Lys Asn Lys Gly Tyr Thr Pro Gly Ser Phe Phe Ala Asn Gly Gln  
195 200 205

Gly Gly Asp Gln Gly Pro Arg Ala Phe Phe Ala Asn Leu Tyr Ser Ala  
210 215 220

Pro Ile Thr Asp Lys Glu Val Thr Lys Tyr Thr Thr Asp Thr Lys Asn  
225 230 235 240

Ser Val Lys Ser Met Lys Lys Ile Val Glu Trp Ile Lys Lys Gly Tyr  
245 250 255

Leu Met Asn Gly Ser Gln Tyr Asp Gly Ser Ala Asp Ile Gln Asn Phe  
260 265 270

Ala Asn Gly Gln Thr Ala Phe Thr Ile Leu Trp Ala Pro Ala Gln Pro  
275 280 285

151

Lys Thr Gln Ala Lys Leu Leu Glu Ser Ser Lys Val Asp Tyr Leu Glu  
290 295 300

Val Pro Phe Pro Ser Glu Asp Gly Lys Pro Asp Leu Glu Tyr Leu Val  
305 310 315 320

Asn Gly Phe Ala Val Phe Asn Asn Lys Asp Glu Asn Lys Val Lys Ala  
325 330 335

Ser Lys Lys Phe Ile Thr Phe Ile Ala Asp Asp Lys Lys Trp Gly Pro  
340 345 350

Lys Asp Val Ile Arg Thr Gly Ala Phe Pro Val Arg Thr Ser Phe Gly  
355 360 365

Asp Leu Tyr Lys Gly Asp Lys Arg Met Met Lys Ile Ser Lys Trp Thr  
370 375 380

Gln Tyr Tyr Ser Pro Tyr Tyr Asn Thr Ile Asp Gly Phe Ser Glu Met  
385 390 395 400

Arg Thr Leu Trp Phe Pro Met Val Gln Ser Val Ser Asn Gly Asp Glu  
405 410 415

Lys Pro Ala Asp Ala Leu Lys Asp Phe Thr Gln Lys Ala Asn Asp Thr  
420 425 430

Ile Lys Lys Ala Ala Lys  
435

<210> 138

<211> 40

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

&lt;400&gt; 138

cgagatctga tatctcacia acagataacg gcgtaaatag

40

&lt;210&gt; 139

&lt;211&gt; 43

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Primer

&lt;400&gt; 139

gaagatcttc cccgggatca caaacagata acggcgtaaa tag

43

&lt;210&gt; 140

&lt;211&gt; 42

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Primer

&lt;400&gt; 140

cgagatctga tatccatcac aaacagataa cggcgtaaat ag

42

&lt;210&gt; 141

&lt;211&gt; 32

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Primer

&lt;400&gt; 141

cgggatcctt atggacctga atcagcgttg tc

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<210> 146

<211> 20

<212> DNA

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<223> Description of Artificial Sequence: Primer

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<210> 147

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<223> Description of Artificial Sequence: Primer

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<223> Description of Artificial Sequence: Primer

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tccggctcgt atgttggtg gaattg

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<210> 149

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<223> Description of Artificial Sequence: Primer

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aagtatcaga tctgatatct cacaaacaga taacggcgta aat

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<210> 150

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<223> Description of Artificial Sequence: Primer

<400> 155

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<223> Description of Artificial Sequence: Primer

<400> 156

ttgcggccgc aggggtttatt tggtgaagtg tcttg

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<210> 157

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40

&lt;210&gt; 158

&lt;211&gt; 34

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Primer

&lt;400&gt; 158

ttgcggccgc tttatgtata gaaacagcag tccc

34

&lt;210&gt; 159

&lt;211&gt; 42

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Primer

&lt;400&gt; 159

cggatccgcc accatgaaag gaagaacaac ctattcgttt ag

42

&lt;210&gt; 160

&lt;211&gt; 34

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Primer

&lt;400&gt; 160

ttgcggccgc aagagcaaat tttcgtatct cctc

34

<210> 161

<211> 35

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Primer

<400> 161

cggatccgcc accatgattg ttggacacgg aattg

35

<210> 162

<211> 37

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Primer

<400> 162

ttgcggcgc tttttcttcc tccaaaataa cactagc

37

<210> 163

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 163

cggatccgcc accatggcga ctaaagagtt aggtgtag

39

<210> 164

<211> 39

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Primer

<400> 164

ttgcggccgc tatagtttta gtttcaactt gtctagatg

39

<210> 165

<211> 39

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Primer

<400> 165

cgggatccac catgtatacg agtttacaac caaatcatg

39

<210> 166

<211> 34

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Primer

<400> 166

ttgcggccgc gtcagctcgt actgtttttt tagc

34

<210> 167

<211> 42

<212> DNA

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<223> Description of Artificial Sequence: Primer

<400> 167

cggatccgcc accatgtgtc aaatgaatag tgaacataaa ag

42

<210> 168

<211> 34

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Primer

<400> 168

ttgcggccgc ctcaaataat ttacctccaa ttcg

34

<210> 169

<211> 39

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<223> Description of Artificial Sequence: Primer

<400> 169

cggatccgcc accatggctc cattcgaatt taaagattc

39

<210> 170

<211> 34

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<213> Artificial Sequence

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<223> Description of Artificial Sequence: Primer

<400> 170

ttgcggccgc tgatttacca gtttgaaga gttc

34

<210> 171

<211> 44

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Primer

<400> 171

cggatccgcc accatgaata ctatttataa tacattgaga acag

44

<210> 172

<211> 31

<212> DNA

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<220>

<223> Description of Artificial Sequence: Primer

<400> 172

ttgcggccgc ttctttgttc caactttctg g

31

<210> 173

<211> 41

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<223> Description of Artificial Sequence: Primer

<400> 173

cggatccgcc accatgatag agtggattca aacacattta c

41

<210> 174

<211> 33

<212> DNA

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<223> Description of Artificial Sequence: Primer

<400> 174

ttgcggccgc tttatgactc aagcgacgtg tta

33

<210> 175

<211> 43

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<223> Description of Artificial Sequence: Primer

<400> 175

cggatccgcc accatggagt tagtaattag agatattcgt aag

43

<210> 176

<211> 35

<212> DNA

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<223> Description of Artificial Sequence: Primer

<400> 176

ttgcggcgc cttgtcatat tcattctcct tcaac

35

<210> 177

<211> 43

<212> DNA

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<223> Description of Artificial Sequence: Primer

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cggatccgcc accatggcta gttttgtcat gaatcataat gac

43

<210> 178

<211> 37

<212> DNA

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<223> Description of Artificial Sequence: Primer

<400> 178

ttgoggcgc gttatttgct cgttgttag ctaaatac

37

<210> 179

<211> 48

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Primer

<400> 179

cggatccgcc accatggctc ttagtttttt tatggtttca gttcaagc

48

<210> 180

<211> 28

<212> DNA

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<223> Description of Artificial Sequence: Primer

<400> 180

ttgcggccgc gaaggcacccg ccacctcc

28

<210> 181

<211> 42

<212> DNA

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<220>

<223> Description of Artificial Sequence: Primer

<400> 181

cggatccgcc accatgggtg aaaccaaga taccaatcaa gc

42

<210> 182

<211> 30

<212> DNA

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<223> Description of Artificial Sequence: Primer

<400> 182

ttgcggccgc aacacctggt gggcgtttgg

30

<210> 183

<211> 35

<212> DNA

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<223> Description of Artificial Sequence: Primer

<400> 183

cggatccgcc accatggctg ggaatcgtaa taacg

35

<210> 184

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ttgcggccgc agccgtctct aaaacaggct tg

32

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<223> Description of Artificial Sequence: Primer

<400> 185

cggatccgcc accatgcttc caacgcagcc gcaaaac

37

<210> 186

<211> 41

<212> DNA

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<223> Description of Artificial Sequence: Primer

<400> 186

ttggggccgc atttagtggt atttctcttg ttgcataatc c

41

<210> 187

<211> 37

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<223> Description of Artificial Sequence: Primer

<400> 187

cgggatccac catgtacacg catattgttg aaaaaag

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<210> 188

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<223> Description of Artificial Sequence: Primer

<400> 188

ttgcggccgc aaataatttc ttttggttgt ttg

33

<210> 189

<211> 40

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<223> Description of Artificial Sequence: Primer

<400> 189

cggatccgcc accatgagta atcaagaagt ttcagcaagc

40

<210> 190

<211> 33

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<223> Description of Artificial Sequence: Primer

<400> 190

ttgcggccgc ccattgtgga atatcagctg aag

33

<210> 191

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cggatccgcc accatggtgc aggcagtggc accgct 36

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ttgcggccgc gcgcattgta acaaattcct cag 33

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<223> Description of Artificial Sequence: Primer

<400> 193

cgggatccac catggctgcc gagaaggata aag 33

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<212> DNA

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<223> Description of Artificial Sequence: Primer

<400> 194

ttgcggccgc attatttagc tgctttttta atgg

34

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<211> 39

<212> DNA

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<223> Description of Artificial Sequence: Primer

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cgggatccac catgtgtcag gttgtttatg caagttttc

39

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<223> Description of Artificial Sequence: Primer

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ggggtaccgg ccaccatggc tgaagtaatt tcaggaagt

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<223> Description of Artificial Sequence: Primer

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<223> Description of Artificial Sequence: Primer

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ttgcggccgc

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<223> Description of Artificial Sequence: Primer

<400> 201

atggaaaaaa atacttgga aaaattac

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<223> Description of Artificial Sequence: Primer

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ctattttgtt ttagcgatgt ctttatac

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<223> Description of Artificial Sequence: Primer

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atgtcaaaac aaaaagtaac ggcaac

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<223> Description of Artificial Sequence: Primer

<400> 204

ttatttatgg ccaataccat aagttaattg

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<223> Description of Artificial Sequence: Primer

<400> 205

atgaaaaaag ttttttttct catggctatg

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<400> 206

ttacttcaac tgttgataga gcacttcc

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<223> Description of Artificial Sequence: Primer

<400> 207

ttgttcaatt ttataggttt tagaacttgg

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<223> Description of Artificial Sequence: Primer

<400> 208

ttaattttca ttgcgtctca aacc

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<212> DNA

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<223> Description of Artificial Sequence: Primer

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ttatttatgt atagaaacag cagtccc

27